



MEMORANDUM

To: Bill Nemser, AICP, LEED AP, Town Planner, Town of Maynard
Town of Maynard Planning Board
Cc: William Depietri, Capital Group Properties
Robert Depietri, Capital Group Properties
From: Jason Sobel, P.E., PTOE; Green International Affiliates, Inc. (Green)
Jayson Gauvin, Green
Date: March 9, 2016
Project: 129 Parker Street
Subject: Preliminary Traffic Evaluation

INTRODUCTION

On behalf of Capital Group Properties (CGP), Green International Affiliates (Green) has prepared this preliminary traffic impact analysis for the proposed development plan for 129 Parker Street in Maynard, MA. In order for the project to proceed, the recent amendments to the Town of Maynard Protective Zoning By-Laws require the approval of a Concept Plan at a Town Meeting prior to the typical Site Plan review by the Planning Board. This preliminary traffic evaluation has been prepared in conjunction with the Concept Plan, consistent with the VHB scope outline provided to the Town of Maynard on January 21, 2016, and includes the following elements:

- The proposed study area for the subsequent Traffic Impact and Access Study.
- Summary of existing traffic count data in the vicinity of the project site.
- Identification of other projects that may affect future traffic conditions.
- Crash data and safety review.
- Preliminary trip generation and trip distribution estimates.
- A general discussion of how the proposed site access and circulation, including a discussion of how “Complete Streets” elements will be incorporated into the project.
- General information regarding existing intersection and roadway operations within the study area
- A general summary of the mitigation associated with this project.

It is noted that many of the elements listed above are expected to be similar to those contained in the 2013 Traffic Impact and Access Study (TIAS)¹ completed for the previous redevelopment plan for the site in February 2013. After the concept plan is approved, all of the elements included in this preliminary evaluation will be discussed in detail in an updated TIAS that will be completed and submitted as part of the Planning Board’s Site Plan review process. The updated TIAS will be consistent with all state and local requirements, and standard industry practice.

PROJECT DESCRIPTION/HISTORY

In 2013, CGP had proposed a redevelopment plan for the site. This plan varied from the previous master plan for the site that was endorsed by the Town of Maynard in 2006. The 2013 proposed plan for the mixed-use development was intended to include a total of sixteen new buildings and one

¹ Green International Affiliates, Inc. Traffic Impact and Access Study: Proposed the Shoppes at Maynard Crossing, February, 2013.

renovated building presently on-site with approximately 720,400 square feet of space. The existing 50,300 square foot commercial building was planned to be renovated and provided to the Town for their use. However, neither the 2006 or 2013 plans were ultimately advanced.

Since 2013, CGP has been working closely with the Town to develop an alternative plan that would be acceptable to both parties. The access for the new proposal is still from Parker Street (Route 27), which abuts the east side of the project site. Parker Street provides connections to the Town of Sudbury to the south and, via continuations of Route 27 such as Acton Street, to the Town of Acton and Route 2 to the north. Figure 1 shows the project site location. The currently proposed plan being advanced is anticipated to include 240,490 square feet (SF) of retail space including a 68,000 SF supermarket, 30,300 SF of commercial space, a 20,000 SF fitness center, 180 apartment units for multi-family rental, and 143 units of senior independent living housing. The existing commercial building is still planned to be retained, with 20,000 SF converted to a fitness center and 30,300 SF remaining as commercial space. In general, the new proposal, while remaining a mixed-use type development, is somewhat smaller in terms of overall size when compared to the 2013 plan.

STUDY AREA

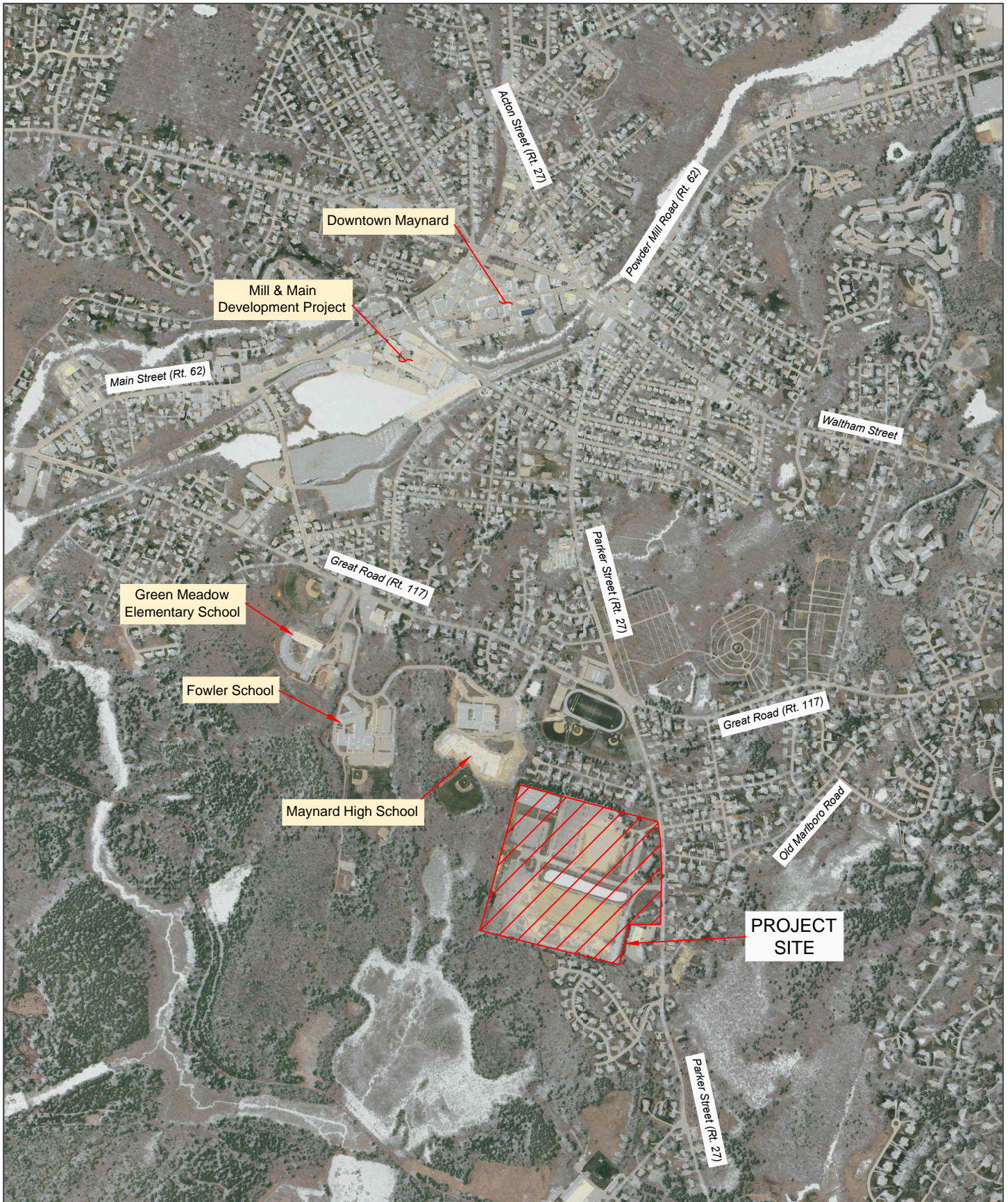
Given that the site was studied in detail in the 2013 TIAS and the economy has remained fairly stable over the past three years, the study area for the updated TIAS is consistent with that of the 2013 TIAS. The proposed study area includes the following intersections:

- Great Road (Route 117) at Main Street (Route 62)
- Great Road at Sudbury Street
- Great Road at Parker Street (Route 27)
- Parker Street at Waltham Street at Powder Mill Road
- Parker Street at Walnut Street
- Parker Street at Field Street / North Street
- Parker Street at South Street
- Parker Street at Old Marlboro Road (northern intersection)
- Parker Street at Vose Hill Road

Although the detailed updated traffic analysis to be conducted in the future and will include updated data collection, some new information such as crash data review was completed for all these locations as part of this preliminary evaluation. The later study will update the traffic data and operating conditions for the complete study area. The two major roadways serving the study area were briefly reviewed for any substantive physical changes. The following summarizes the characteristics of these two roadways.

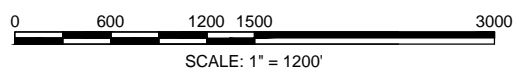
Parker Street (Route 27) is a two lane undivided road with one travel lane for each direction of traffic. It is under the jurisdiction of the Town of Maynard and is classified as an urban principal arterial in the vicinity of the project site. Parker Street has signalized intersections with Great Road (Route 117) and Waltham Street at Powder Mill Road within the study area.

Great Road is also a two lane undivided road functioning as an urban principal arterial west of Parker Street and an urban minor arterial east of Parker Street. It is under the jurisdiction of the Town of Maynard and has signalized intersections with Main Street (Route 62) and Parker Street within the study area. Great Road provides access to the Maynard High School as well as other Maynard Public Schools approximately 800 feet west of Parker Street.



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CIVIL AND STRUCTURAL ENGINEERS

Figure 1
Project Location
129 Parker Street
Maynard, MA



TRAFFIC VOLUMES

As part of this preliminary evaluation, one new traffic count was conducted on Parker Street in the vicinity of the project site. The automatic traffic recorder (ATR) count was conducted for a 48-hour period beginning on October 30, 2015 and included Friday and Saturday traffic data. The new ATR data was reviewed and compared to the previous ATR data also collected on Parker Street in the vicinity of the site for the 2013 TIAS in November 2012. Tables 1 summarizes the ATR data.

Table 1 - Summary of Observed Weekday ATR Traffic Data

	Weekday			Saturday	
	AM Peak Hour	PM Peak Hour	Daily	Mid-Day Peak Hour	Daily
November 2012	1,156 vph	1,265 vph	14,608 vpd	934 vph	11,815 vpd
October 2015	873 vph	971 vph	10,968 vpd	711 vph	8,169 vpd
Change	-283 vph	-294 vph	-3,640 vpd	-223 vph	-3,646 vpd
% Change	-24%	-23%	-25%	-24%	-31%
<u>Notes:</u> vph = vehicles per hour vpd = vehicles per day					

A review of these data showed significant decreases in traffic volumes on Parker Street throughout the different peak periods between November 2012 and October 2015. The new data showed consistent results for the two weekdays observed. Green thoroughly reviewed the 2015 ATR data and there appears to have been no malfunctions nor errors with the data collection equipment. At this time, there is no further explanation relative to the variation between the two different count years.

Traffic data were collected throughout the proposed study area in November 2012 as part of the 2013 TIAS. New traffic data will be collected at each study intersection as part of the forthcoming updated TIAS. The new data will then be compared to the 2012 data to verify currently observed traffic volume trends throughout the study area.

CRASH EXPERIENCE

The crash history of all the study intersections was obtained from the MassDOT Crash Record System (CRS) for the most recent three-year period available (2011-2013) as part of this preliminary study.

In addition to summarizing the data and identifying the crash characteristics, the average number of crashes reported annually and the reported crash rate were computed. The crash rate at each study intersection is measured in crashes per million entering vehicles (MEV). The standard MassDOT Crash Rate Worksheet was used to determine the crash rate at each location. The calculation of the crash rate relates the number of accidents at a location to the amount of traffic that passes through the location. It is a more comprehensive measure for identifying potentially hazardous locations compared to simple averages as it takes into account volume, although crash rates can skew higher due to low volumes. Calculations used the historical traffic volumes with the new crash frequency data. The calculated rates were compared to the MassDOT District-wide averages. Intersections experiencing crash rates greater

than the averages are potentially experiencing unusually high number or higher than expected number of crashes relative to traffic volumes at that particular location and may warrant further investigation or improvements. MassDOT District 3, which includes the Town of Maynard, has an average crash rate of 0.89 for signalized intersections and 0.66 for unsignalized intersections. The crash rate worksheets are included in the attached Appendix.

It is noted that there were zero reported crashes at the following study intersections during the three-year period that was examined:

- Parker Street at Vose Hill Road
- Parker Street at South Street
- Parker Street at North Street / Field Street
- Great Road at Sudbury Street

Table 2 shows that the crash rate at each study intersection is below the MassDOT District 3 average crash rate for the corresponding type of intersection control as each intersection averages three or fewer crashes per year from 2011-2013. Overall, the review of historical crash experience reveals that no significant safety deficiency or issue exists based on the exhibited intersection crash data. Of note, however, 25% of the reported crashes (2 of 8) at the intersection of Great Road with Main Street were collisions with bicycles. The intersection of Parker Street with Walnut Street had 5 reported crashes from 2011-2013, of which three (60%) were rear-ends.

Table 2 – Summary of Reported Crash Data (2011-2013)

	Great Rd (Route 117) at Main St (Route 62)			Great Road at Parker Street (Route 27)			Parker Street / Powder Mill Road (Route 62) at Waltham Street			Parker Street at Old Marlboro Road			Parker Street at Walnut Street		
	2011	2012	2013	2011	2012	2013	2011	2012	2013	2011	2012	2013	2011	2012	2013
Severity															
Property Damage	3	1	1	1	1	1	1	2	4					3	1
Injury		1													
Fatality															
Unknown	1		1					1	1		1				1
Collision Type															
Rear End	2						1		2					2	1
Angle		1		1				1	2					1	
Side Swipe	1				1			1							
Head On	1							1	1						
Single Vehicle			1			1					1				
Collision with Ped															
Collision with Bike		1	1												
Other/Unknown															1
Time of Day															
6:01 AM – 10:00 AM	1								3						
10:01 AM – 4:00 PM	1	1	1	1			1		1		1			1	
4:01 PM – 7:00 PM	2	1												1	2
7:01 PM – 6:00 AM			1		1	1		3	1					1	
Roadway Conditions															
Dry	3	2	2	1	1	1	1	3	3		1			3	2
Wet	1								1						
Snow/Ice									1						
Other/Unknown															
Season															
Dec-Feb	2			1	1		1	2	3					1	
Mar-May	1										1			1	1
June-Aug		2	2			1									
Sept-Nov	1							1	2					1	1
Light Conditions															
Daylight	3	2	1	1			1		3		1			1	1
Dawn/Dusk									1						
Dark (Unlit)															
Dark (Lit)	1		1		1	1		3	1					2	1
Unknown															
Totals	4	2	2	1	1	1	1	3	5	0	1	0	0	3	2
Annual Average Crashes	2.67			1.00			3.00			0.33			1.67		
Intersection Crash Rate	0.47			0.12			0.42			0.08			0.38		
MassDOT District 3 Average Crash Rate	0.89			0.89			0.89			0.66			0.66		

INTERSECTION CAPACITY ANALYSIS

As part of this preliminary evaluation, the intersection capacity analyses completed as part of the previous 2013 TIAS were reviewed. The complete analyses are contained in the 2013 TIAS, but for ease of reference the overall intersection Level of Service (LOS) for the signalized intersections are presented in Table 3. At the unsignalized intersections, only the critical movement LOS is summarized.

Table 3 –Peak Hour Intersection Capacity Analysis (from 2013 TIAS)

STUDY INTERSECTION	AM PEAK HOUR	PM PEAK HOUR	SAT PEAK HOUR
Great Rd at Main St (Signalized)			
Overall LOS	A	C	A
Parker St at Waltham St at Powder Mill Rd (Signalized)			
Overall LOS	C	C	C
Parker St at Great Rd (Signalized)			
Overall LOS	B	C	A
Parker St at Walnut St			
Walnut St EB LR	C	C	A
Great Rd at Sudbury St			
Sudbury St SB LR	F	F	B
Parker St at North St at Field St			
Field St EB LTR	D	D	C
North St WB LTR	B	C	B
Parker St at South St			
South St WB LR	B	C	B
Parker St at Old Marlboro Rd			
Old Marlboro Rd WB LR	C	C	C
Parker St at Vose Hill Rd			
Vose Hill Rd EB LR	C	C	C

As indicated in the table above, all study intersections operate well during the peak hours, with each intersection and approach operating at a LOS 'D' or better. The one exception is the Sudbury Street approach to Great Road, which operates at a LOS 'F' during the weekday AM and PM peak hours. This is likely due to high traffic volumes traveling on Great Road during the weekday peak periods forcing vehicles on Sudbury Street waiting for a gap in traffic to turn onto Great Road. It is noted that complete and updated intersection capacity analyses for existing, future no-build, and future build conditions will be provided in the forthcoming TIAS.

OTHER SPECIFIC PROJECTS

To further understand future traffic conditions in the vicinity of the project site, other nearby projects that could affect traffic conditions in the study area were researched and taken into consideration. Through conversations with the Town Planner, Town Engineer, and general knowledge of the study area, Green identified several other projects in the vicinity of the project. These include:

- **Mill & Main:** The owner of the Mill & Main facility has changed since the previous 2013 TIAS, and the future plans and vision for the Mill & Main facility have changed over the past year. The Site Plan and Special Permit request for “Phase 1 and Phase 1A” for the redevelopment of the Mill & Main Building at 12 Suite 200, Clock Tower Place was approved by the Town of Maynard Planning Board in November of 2015. This phase includes the removal of two buildings on-site, construction of new on-site building entrances, exterior renovations to several on-site buildings, and parking lot improvements including an ornamental feature of the garage. This project is a reuse of existing buildings and no additional buildings are proposed at this time. The occupancy of the Mill & Main facility will be gauged at the time of the traffic data collection for the upcoming TIAS for 129 Parker Street. If needed, adjustments to future occupancy levels at Mill & Main will be considered when conducting future traffic volume forecasts.
- **129 Acton Street:** The construction of a residential development consisting of 18 townhouse apartment units at 129 Acton Street in Maynard. The project site was previously an undeveloped parcel of land between Acton Street and Brown Street (Route 27), and is currently under construction.
- **Assabet River Rail Trail (ARRT):** The ARRT is a multi-use path that will eventually connect the communities of Marlborough, Hudson, Stow, Maynard, and Acton. The current project is to connect the ARRT from the Stow/Maynard town line to the South Acton Commuter Rail Station. Construction is anticipated to start in the Summer of 2016.
- **Parker Street (Route 27)/ Great Road (Route 117) - Signal Improvements:** The Town of Maynard is considering implementing traffic signal timing and equipment improvements at the intersection of Parker Street and Great Road in the Spring/Summer 2016.

TRIP GENERATION

In order to estimate the number of trips that could be generated by the proposed development, statistics published by the Institute of Transportation Engineers (ITE) in Trip Generation² for similar land uses were examined. The ITE trip generation statistics represent compilations of data from studies/projects throughout the United States collected over the past 40+ years on trip generation characteristics for different types of land uses. The data has been compiled to provide transportation analysts with guidelines in forecasting 24 hour and peak hour volumes for the specified use.

Based on a review of the ITE database, a combination of the five different proposed land uses have been selected as the most similar to the project type. These land uses correspond to Land Use Code (LUC) 220 for residential apartments; LUC 252 for a senior independent living facility; LUC 492 for fitness club; LUC 710 for general office/commercial space; and LUC 820, which corresponds to the retail component. Calculations were first completed for each land use and the estimated vehicle trips (without adjustment) generated by the project. Adjustments related to internal capture, pass-by, and diverted traffic were

² Institute of Transportation Engineers, Trip Generation, Washington, D.C., 9th Edition, 2012.

then applied consistent with current industry practices and MassDOT guidelines. Driveway volumes included new pass-by, and diverted trips. Internal capture trips represent trips between different land uses on the site and do not reach the street network. Table 4 presents a summary of the estimated net new vehicle trips generated by the currently proposed project. Detailed trip generation calculations for each use and the internal capture worksheets are attached.

Table 4 – Trip Generation Summary

LAND USE	WEEKDAY							SATURDAY			
	AM PEAK HOUR			PM PEAK HOUR			DAILY	MIDDAY PEAK HOUR			DAILY
	ENTER	EXIT	TOTAL	ENTER	EXIT	TOTAL		ENTER	EXIT	TOTAL	
Shopping Center (240.49 KSF)											
Total trips	165	101	266	518	561	1,079	12,013	804	742	1,546	16,060
Internal Trips	4	4	8	28	47	75	582	18	34	52	526
Pass-by/Diverted Trips	55	33	88	150	150	300	3,480	90	90	180	2,048
<i>Net New Trips</i>	<i>106</i>	<i>64</i>	<i>170</i>	<i>340</i>	<i>364</i>	<i>704</i>	<i>7,951</i>	<i>696</i>	<i>618</i>	<i>1,314</i>	<i>13,486</i>
Fitness Club (20 KSF)											
Total trips	14	14	28	42	32	74	660	25	31	56	418
Internal Trips	0	0	0	2	3	5	31	1	1	2	14
Pass-by/Diverted Trips	5	5	10	10	10	20	180	3	3	6	52
<i>Net New Trips</i>	<i>9</i>	<i>9</i>	<i>18</i>	<i>30</i>	<i>19</i>	<i>49</i>	<i>449</i>	<i>21</i>	<i>27</i>	<i>48</i>	<i>352</i>
Commercial (30.3 KSF)											
Total trips	65	9	74	19	93	112	530	7	6	13	76
Internal Trips	5	3	8	8	16	24	56	5	1	6	8
<i>Net New Trips</i>	<i>60</i>	<i>6</i>	<i>66</i>	<i>11</i>	<i>77</i>	<i>88</i>	<i>474</i>	<i>2</i>	<i>5</i>	<i>7</i>	<i>68</i>
Apartments(180 units)											
Total trips	18	74	92	76	41	117	1,156	46	46	92	1,126
Internal Trips	1	1	2	37	13	50	414	22	15	37	402
<i>Net New Trips</i>	<i>17</i>	<i>73</i>	<i>90</i>	<i>39</i>	<i>28</i>	<i>67</i>	<i>742</i>	<i>24</i>	<i>31</i>	<i>55</i>	<i>724</i>
Independent Living (142 units)											
Total trips	10	18	28	19	17	36	432	25	19	44	372
Internal Trips	0	1	1	9	5	14	154	11	6	17	132
<i>Net New Trips</i>	<i>10</i>	<i>17</i>	<i>27</i>	<i>10</i>	<i>12</i>	<i>22</i>	<i>278</i>	<i>14</i>	<i>13</i>	<i>27</i>	<i>240</i>
Total Net New Trips	202	169	371	430	500	930	9,894	757	694	1,451	14,870

As indicated in the table above, the new building program is expected to result in a weekday total of 9,894 net new vehicle trips over the course of a typical weekday with 4,947 entering trips and 4,947 exiting trips made in that time. During the AM peak hour, it is estimated that 371 net new vehicle trips will be generated with 202 entering trips and 169 exiting trips. It is estimated that 930 net new vehicle trips will be generated in the PM peak hour with 430 entering trips and 500 exiting trips. Saturday traffic estimates are somewhat higher than the weekday given the retail and supermarket uses, however, it is noted that the Parker Street volumes are substantially lower on Saturday than a typical weekday.

Under the current development plan, 20,000 SF of the existing 50,300 SF commercial building located on the site is proposed to be converted to a fitness center, with the remaining 30,300 SF retained as commercial space. However, the exact disposition of the existing commercial building has not yet been finalized. In addition to this scenario, one alternative is for the existing commercial building to be converted to a 20,000 SF fitness center but the remaining space converted to 30,300 SF of retail space. A third alternative is to eliminate the fitness center and commercial space from the redevelopment and convert the entire 50,300 SF to retail space. These redevelopment alternatives are estimated to decrease the number of site-generated vehicle trips by as much as 54 vehicle trips during the weekday AM peak hour, but increase the number of site-generated vehicle trips by as much as 42 vehicle trips during the weekday PM peak hour, and increase the estimated site-generated vehicle-trips by 184 vehicles during a typical weekday. The Saturday site-generated vehicle trips are expected to increase under both alternatives for this building, with the midday peak hour and daily site-generated vehicle trips increasing by as much as 146 and 1,561 vehicle trips, respectively.

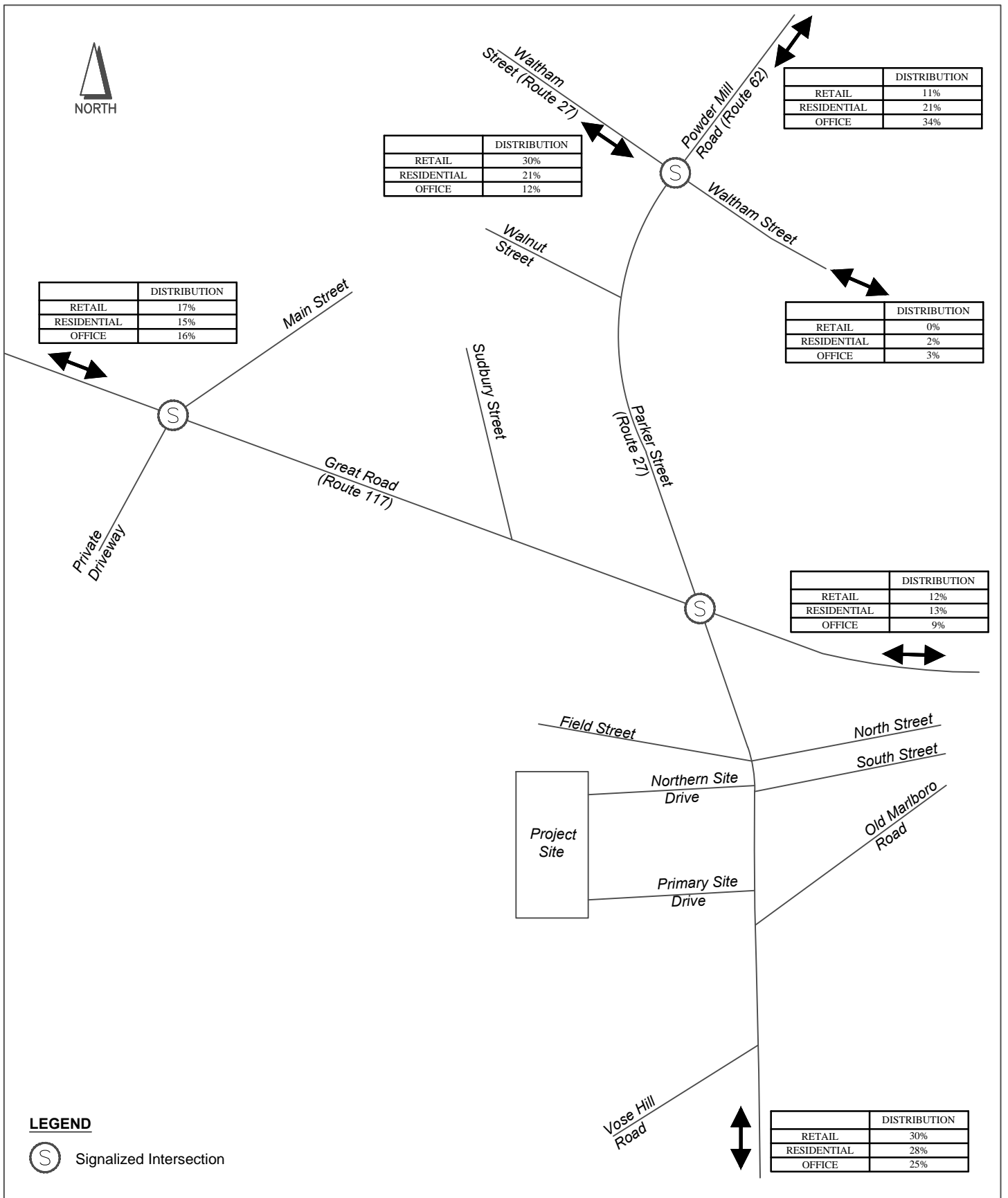
In all scenarios, the expected trip generation characteristics of the current concept plan are expected to be lower than that of the previously proposed plan analyzed in the 2013 TIAS. Table 5 provides a comparison of the current and previous trip generation estimates.

Table 5 – Trip Generation Comparison

Proposal Plan	Total Project Net New Trips				
	Weekday AM Peak Hour	Weekday PM Peak Hour	Weekday Daily	Saturday Midday Peak Hour	Saturday Daily
2013 Redevelopment Plan	430	1,207	13,004	1,571	15,998
2016 Redevelopment Plan	371	930	9,894	1,451	14,870

Compared to the 2013 redevelopment proposal, the current trip generations are approximately 14% and 23% lower during the AM and PM peak hours, respectively. Under the current plan, the net new weekday daily traffic is approximately 24% lower than the 2013 redevelopment proposal. The current projections for net new trips are approximately 8% lower during the Saturday midday peak hour and approximately 7% lower during the Saturday daily.

The trip distribution pattern that vehicles use to travel to and from the site is expected to be similar to the pattern developed in the 2013 TIAS and is displayed in Figure 2; although it is noted that minor adjustments may be made for the full TIAS.



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CIVIL AND STRUCTURAL ENGINEERS

Figure 2
Estimated Trip Distribution
129 Parker Street
Maynard, MA

OFF-SITE MITIGATION

As part of this preliminary evaluation, potential locations of off-site mitigation were identified. While no new intersection analyses were completed for this preliminary evaluation, the recommendations contained in the 2013 TIAS were reviewed to determine general applicability to the current concept plan being proposed. Additionally, a December 2006 Memorandum of Agreement (MOA)³ between the previous property owner (129 Parker Street, LLC) and the Town of Maynard identified several off-site mitigation measures in the vicinity of the project site. It is noted that modifications to these mitigation measures may be necessary dependent on the findings of the forthcoming TIAS.

In the time since the 2013 TIAS, the Town has completed some infrastructure improvements in the vicinity of the project site, including some resurfacing on Parker Street and sidewalk work along sections of Parker Street north of the 129 Parking Street site. The following identifies the previous recommended actions (from the 2013 TIAS) with updated comments as appropriate.

- The intersection of Parker Street with Great Road should be updated in terms of traffic signal equipment, signal timing and geometry including lengthening the northbound left turn lane capacity. This is expected to remain applicable although will need to be verified. The town completed resurfacing along Parker Street and through the intersection that affected the vehicle detectors. As previously discussed, the Town may implement traffic signal timing and equipment improvements at this location in the Spring/Summer of 2016.
- Guide signage should be installed in key locations on Great Road and Parker Street and at the site drive indicating the preferred routes and turns between the project site and Great Road (Route 117). This should also include a pylon type sign with major tenants listed and be located at the Great Road at Parker Street intersection ideally in the southeast quadrant of the intersection to better inform motorists prior to reaching Parker Street. This is expected to remain applicable.
- Work with the Town to ensure optimum signal timing and operations occur at the intersection of Parker Street with Powder Mill Road and Waltham Street. This is expected to remain applicable.
- Since the 2013 TIAS, the town has improved the sidewalk along the west side of Parker Street. As part of the project and associated roadwork along the site frontage, there is likely some adjustments and refinements to be installed when the site/street construction work is underway. The result will be an ADA compliant sidewalk along the site's frontage and connects to the internal sidewalk system as well as the Town's sidewalk system.
- While it was recommended in the past that a sidewalk be installed on the east side of Parker Street between Old Marlboro Road and North Street, the right of way (ROW) is insufficient to accommodate this action. This could be revisited in the detailed design stage of the project during the permitting process.
- A pedestrian crossing warning beacon system is recommended for Parker Street at Field Street regardless of the disposition of the sidewalk along the east side of Parker Street. This is expected to remain applicable.
- It will continue to be recommended that the development's ownership join the region's Transportation Management Association (TMA), which includes the Town of Maynard and participate in the Cross Connect service. The site design should consider transit vehicle internal circulation with designated passenger stops.
- The site plan should incorporate bicycle parking/secure storage facilities in strategic locations.

³ Town of Maynard, Chartwell Properties. "Memorandum of Agreement". December 2006.

In addition, off-site mitigation measures are proposed at several local intersections in the vicinity of the site. These intersection improvements will either be direct improvements made by CGP or improvements made by the Town of Maynard with mitigation funding by CGP and will follow “Complete Streets” design principles where feasible. The locations of these local intersection improvements can be seen in Figure 3. Also, the original studies completed in 2006 and 2013 recognized there could potentially be impacts to the nearby neighborhood east of the project site and bounded by Great Road, Parker Street, and Old Marlboro Road in terms of undesirable intrusion. It had been suggested that various *traffic calming* actions be considered, however, that would require involvement of the town, the neighborhood and possibly the applicant. This issue is likely to be explored further as the development advances.

COMPLETE STREETS EVALUATION

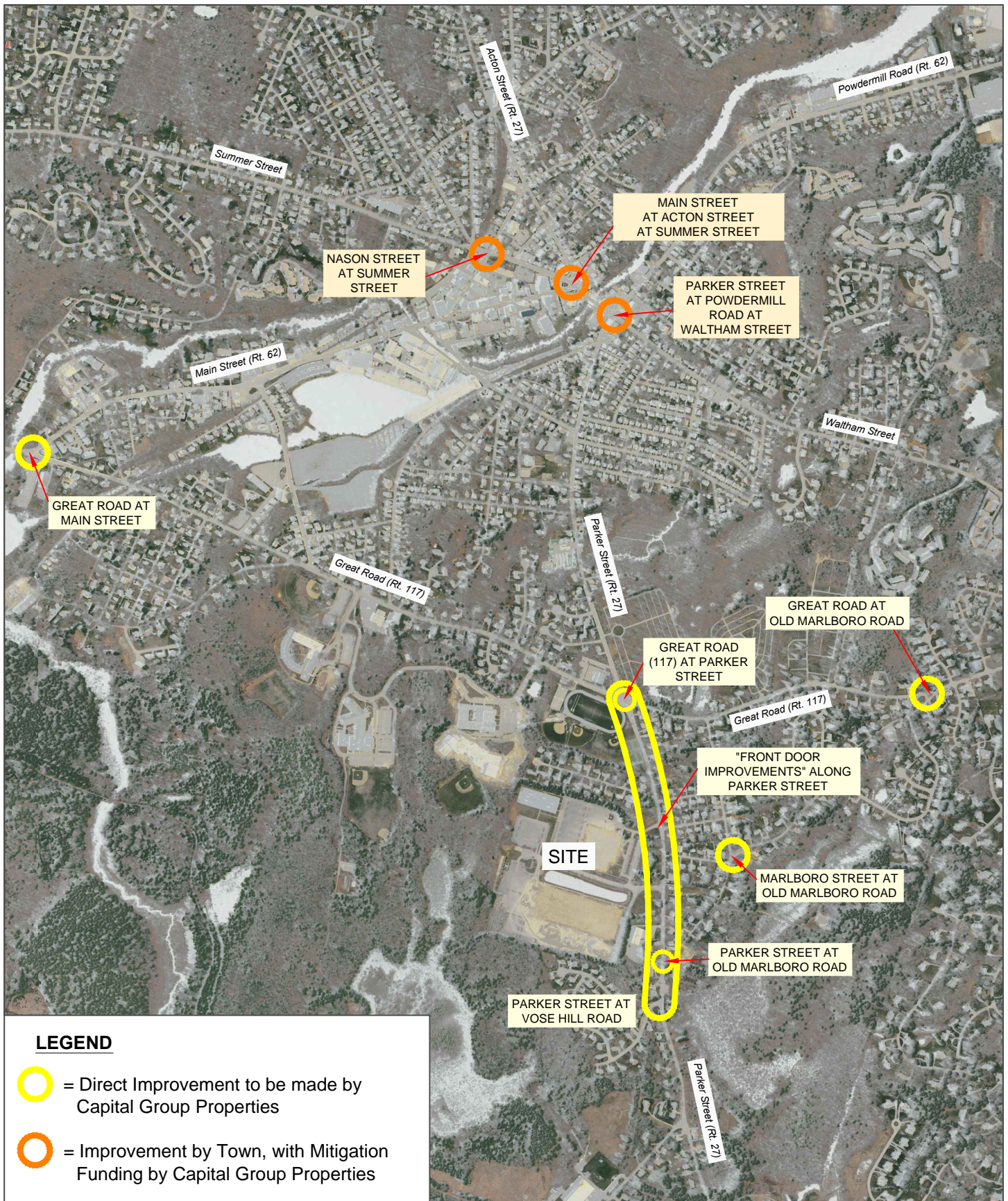
In November of 2013, a “Complete Street Resolution” was issued by the Town of Maynard Town Administrator. This document establishes that the Town of Maynard is committed to increasing walking and bicycling, increasing mobility for those without access to automobiles, and reducing traffic congestion by incorporating Complete Streets design principles into the planning, design, approval, and implementation of all transportation projects. To be consistent with the Town’s goals, all site access improvements along Parker Street will include Complete Streets design elements where feasible.

The proposed site access improvements include the widening of a segment of Parker Street along the frontage of the proposed project site to include a southbound right-turn only lane and a northbound left-turn only lane on Parker Street entering the site. The widening of this segment of Parker Street will include five foot shoulders for bicycle accommodation where there is sufficient Right-of-Way available. Parker Street will transition back to the public Right-of-Way where the property is not owned by CGP. At other intersections where mitigation may be proposed, pedestrian and bicycle accommodations will be evaluated, and implemented where feasible.

The current proposed concept plan also includes many Complete Streets design elements. The following pedestrian accommodations are shown in the current concept plan to ensure safe internal pedestrian circulation:

- Sidewalks along both sides of the site driveway.
- Sidewalk connections to the sidewalk on Parker Street at five locations.
- Pedestrian paths connecting areas of the parking lots to the entrances of the building.
- Sidewalks and crosswalks throughout the project site to the different areas and uses within the site.
- A walkway is provided along the western side of the project site to provide a direct pedestrian connection to Maynard High School and the other public schools along Tiger Drive.

In addition to the accommodations listed above, the full site plan should include designated bicycle parking areas in convenient locations throughout the site to accommodate bicycle traffic to and from the site. It is expected that these design refinements will be added to the plan as the project progresses.



SUMMARY

This preliminary traffic evaluation has assessed several elements of the traffic impacts of the proposed Maynard Crossing development at 129 Parker Street in regards to the on and off-site transportation network. This preliminary evaluation has included the following elements:

- The proposed study area for the subsequent Traffic Impact and Access Study.
- Summary of existing traffic count data in the vicinity of the project site.
- Identification of other projects that may affect future traffic conditions.
- Crash data and safety review.
- Preliminary trip generation and trip distribution estimates.
- A general discussion of how the proposed site access and circulation, including a discussion of how “Complete Streets” elements will be incorporated into the project.
- General information regarding existing intersection and roadway operations within the study area
- A general summary of the mitigation associated with this project.

The expected vehicle trip generation characteristics of the current Concept Plan for the redevelopment of 129 Parker Street are significantly lower than the 2013 proposal. As a result, the previously identified off-site mitigation is expected to be sufficient to accommodate the current 129 Parker Street Concept Plan. It is noted that all of the transportation elements discussed in this memorandum will be evaluated in detail in the forthcoming updated TIAS that will be completed and submitted as part of the subsequent Site Plan review process.

APPENDIX

APPENDIX
TRAFFIC COUNT DATA



PRECISION
DATA
INDUSTRIES, LLC

PRECISION DATA INDUSTRIES, LLC

Office: 508.481.3999 Fax: 508.545.1234

Email: datarequests@pdillc.com

Traffic Counts with Precision



Google earth
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600 ft

Client:
Green International

Engineer:
J. Gauvin

Site Code:
TBA

Date:
Fri 10/30 thru Sat 10/31/15

PDI Job Number:
154779

City, State:
Maynard, MA

Parker Street (Route 27)
south of B Street
City, State: Maynard, MA
Client: Green/ J. Gauvin



P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

154779 A Class
Site Code: 15104
Date Start: 30-Oct-15

NB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
10/30/1														
5	0	21	1	0	0	0	0	0	0	0	0	0	0	22
01:00	0	12	1	0	0	0	0	0	0	0	0	0	0	13
02:00	0	6	0	0	0	0	0	0	0	0	0	0	0	6
03:00	0	3	0	0	0	0	0	0	0	0	0	0	0	3
04:00	0	9	0	0	0	0	0	0	0	0	0	0	0	9
05:00	1	43	10	0	1	0	0	0	0	1	0	0	0	56
06:00	1	143	23	2	4	1	0	0	0	0	0	0	0	174
07:00	3	273	42	3	5	1	1	0	0	0	0	0	0	328
08:00	0	291	41	0	8	3	0	2	0	0	0	0	0	345
09:00	1	245	48	3	14	5	0	2	1	0	0	0	0	319
10:00	3	193	36	2	10	2	0	1	1	0	0	0	0	248
11:00	2	214	49	1	13	3	1	1	2	0	0	0	0	286
12 PM	1	246	59	2	5	3	0	3	0	0	0	0	0	319
13:00	2	230	48	2	6	4	0	3	0	0	0	0	0	295
14:00	2	288	69	1	8	5	0	4	1	0	0	0	0	378
15:00	4	388	76	1	9	2	1	1	0	0	0	0	0	482
16:00	8	461	79	2	13	2	0	2	2	0	0	0	0	569
17:00	8	427	48	0	7	5	0	3	0	0	0	0	0	498
18:00	0	359	31	1	4	0	0	1	0	0	0	0	0	396
19:00	0	220	18	0	4	0	0	0	0	0	0	0	0	242
20:00	1	152	15	0	1	0	0	0	0	0	0	0	0	169
21:00	0	124	9	0	1	0	0	0	1	0	0	0	0	135
22:00	0	80	9	0	1	0	0	0	0	0	0	0	0	90
23:00	0	54	3	0	0	0	0	0	1	0	0	0	0	58
Total	37	4482	715	20	114	36	3	23	9	1	0	0	0	5440
Percent	0.7%	82.4%	13.1%	0.4%	2.1%	0.7%	0.1%	0.4%	0.2%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	08:00	11:00	07:00	09:00	09:00	07:00	08:00	11:00	05:00				08:00
Vol.	3	291	49	3	14	5	1	2	2	1				345
PM Peak	16:00	16:00	16:00	12:00	16:00	14:00	15:00	14:00	16:00					16:00
Vol.	8	461	79	2	13	5	1	4	2					569

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154779 A Class
Site Code: 15104
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NB

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10/31/1														
5	0	17	3	0	0	0	0	0	0	0	0	0	0	20
01:00	0	14	1	0	0	0	0	0	0	0	0	0	0	15
02:00	0	8	1	0	0	0	0	0	0	0	0	0	0	9
03:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
04:00	0	7	0	0	2	0	0	0	0	0	0	0	0	9
05:00	0	15	4	0	0	0	0	0	0	0	0	0	0	19
06:00	0	37	7	0	0	0	0	0	0	0	0	0	0	44
07:00	0	101	20	0	2	0	0	1	1	0	0	0	0	125
08:00	0	160	29	0	2	1	0	0	1	0	0	0	0	193
09:00	0	224	30	0	6	1	0	0	0	1	0	0	0	262
10:00	3	246	37	2	6	3	0	0	1	0	0	0	0	298
11:00	0	268	28	1	6	0	0	0	0	1	0	0	0	304
12 PM	2	286	32	0	5	4	1	2	0	0	0	0	0	332
13:00	2	295	40	1	6	2	0	0	0	0	0	0	0	346
14:00	5	297	24	0	5	0	0	0	0	0	0	0	0	331
15:00	3	302	33	0	4	1	0	0	0	0	0	0	0	343
16:00	1	318	22	0	1	0	0	3	0	0	0	0	0	345
17:00	1	245	25	0	3	0	0	0	1	0	0	0	0	275
18:00	1	170	19	0	2	1	0	0	0	0	0	0	0	193
19:00	0	134	12	0	0	0	0	0	0	0	0	0	0	146
20:00	0	123	8	0	1	0	0	0	0	0	0	0	0	132
21:00	0	111	4	0	0	0	0	0	0	0	0	0	0	115
22:00	0	99	3	0	0	0	0	0	0	0	0	0	0	102
23:00	0	61	2	0	0	0	0	0	0	0	0	0	0	63
Total	18	3540	384	4	51	13	1	6	4	2	0	0	0	4023
Percent	0.4%	88.0%	9.5%	0.1%	1.3%	0.3%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	10:00	11:00	10:00	10:00	09:00	10:00		07:00	07:00	09:00				11:00
Vol.	3	268	37	2	6	3		1	1	1				304
PM Peak	14:00	16:00	13:00	13:00	13:00	12:00	12:00	16:00	17:00					13:00
Vol.	5	318	40	1	6	4	1	3	1					346
Total		8022	1099	24	165	49	4	29	13	3	0	0	0	9463

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SB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
10/30/1														
5	0	17	2	0	1	0	0	0	0	0	0	0	0	20
01:00	0	7	1	0	0	0	0	0	0	0	0	0	0	8
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	5	0	0	1	0	0	0	0	0	0	0	0	6
04:00	0	22	4	0	0	0	0	0	0	0	0	0	0	26
05:00	0	76	15	1	6	1	0	0	1	0	0	0	0	100
06:00	1	306	71	2	9	3	1	0	0	0	0	0	0	393
07:00	1	408	73	2	13	5	0	2	0	0	0	0	0	504
08:00	3	348	56	2	12	3	0	2	0	0	0	0	0	426
09:00	1	313	57	1	14	3	1	1	1	0	0	0	0	392
10:00	2	245	53	3	12	5	0	3	0	0	0	0	0	323
11:00	2	223	57	1	14	2	0	0	1	1	0	0	0	301
12 PM	2	240	42	1	11	5	0	3	1	0	0	0	0	305
13:00	2	252	35	3	4	3	0	3	1	0	0	0	0	303
14:00	3	273	43	3	6	3	0	0	1	0	0	0	0	332
15:00	0	306	31	4	9	2	0	2	0	0	0	0	0	354
16:00	3	332	46	0	4	2	1	2	0	0	0	0	0	390
17:00	5	423	39	0	6	0	0	0	0	0	0	0	0	473
18:00	2	286	25	0	4	1	0	1	1	0	0	0	0	320
19:00	1	185	15	0	2	0	0	1	0	0	0	0	0	204
20:00	0	104	8	0	1	0	0	0	0	0	0	0	0	113
21:00	0	99	8	0	1	0	0	0	0	0	0	0	0	108
22:00	0	88	2	0	0	0	0	0	0	0	0	0	0	90
23:00	0	32	5	0	0	0	0	0	0	0	0	0	0	37
Total	28	4590	688	23	130	38	3	20	7	1	0	0	0	5528
Percent	0.5%	83.0%	12.4%	0.4%	2.4%	0.7%	0.1%	0.4%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	08:00	07:00	07:00	10:00	09:00	07:00	06:00	10:00	05:00	11:00				07:00
Vol.	3	408	73	3	14	5	1	3	1	1				504
PM Peak	17:00	17:00	16:00	15:00	12:00	12:00	16:00	12:00	12:00					17:00
Vol.	5	423	46	4	11	5	1	3	1					473

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SB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
10/31/1														
5	0	16	0	1	0	0	0	0	0	0	0	0	0	17
01:00	0	9	1	0	0	0	0	0	0	0	0	0	0	10
02:00	0	2	2	0	0	0	0	0	0	0	0	0	0	4
03:00	0	3	0	0	2	0	0	0	0	0	0	0	0	5
04:00	0	10	0	0	0	0	0	0	1	0	0	0	0	11
05:00	0	21	7	0	0	0	0	0	0	0	0	0	0	28
06:00	0	64	13	1	4	0	0	1	0	0	0	0	0	83
07:00	0	108	28	1	5	1	0	1	1	0	0	0	0	145
08:00	0	188	47	0	10	0	0	0	0	0	0	0	0	245
09:00	1	227	28	0	6	0	0	1	1	0	0	0	0	264
10:00	0	296	40	1	3	1	0	0	2	0	0	0	0	343
11:00	3	327	26	1	5	0	1	1	1	0	0	0	0	365
12 PM	4	314	35	0	9	0	0	0	0	0	0	0	0	362
13:00	1	330	32	0	4	1	0	0	0	0	0	0	0	368
14:00	4	306	31	1	1	1	0	0	0	0	0	0	0	344
15:00	6	321	26	0	4	0	0	0	0	0	0	0	0	357
16:00	2	303	27	0	3	2	0	0	0	0	0	0	0	337
17:00	1	229	22	0	3	0	0	0	0	0	0	0	0	255
18:00	0	166	13	0	3	2	0	0	0	0	0	0	0	184
19:00	0	109	7	0	0	0	0	1	0	0	0	0	0	117
20:00	0	104	6	0	0	0	0	0	1	0	0	0	0	111
21:00	1	79	2	0	0	0	0	0	0	0	0	0	0	82
22:00	0	59	3	0	0	0	0	0	0	0	0	0	0	62
23:00	0	43	4	0	0	0	0	0	0	0	0	0	0	47
Total	23	3634	400	6	62	8	1	5	7	0	0	0	0	4146
Percent	0.6%	87.7%	9.6%	0.1%	1.5%	0.2%	0.0%	0.1%	0.2%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	11:00	08:00	00:00	08:00	07:00	11:00	06:00	10:00					11:00
Vol.	3	327	47	1	10	1	1	1	2					365
PM Peak	15:00	13:00	12:00	14:00	12:00	16:00		19:00	20:00					13:00
Vol.	6	330	35	1	9	2		1	1					368
Total		8224	1088	29	192	46	4	25	14	1	0	0	0	9674

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154779 A Speed
Site Code: 15104
Date Start: 30-Oct-15

NB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
10/30/ 15	0	0	0	1	3	15	2	1	0	0	0	0	0	22	38	37
01:00	0	0	0	0	3	4	3	3	0	0	0	0	0	13	45	39
02:00	0	0	0	0	0	3	1	1	1	0	0	0	0	6	49	42
03:00	0	0	0	0	1	0	1	1	0	0	0	0	0	3	46	40
04:00	0	0	0	0	3	4	2	0	0	0	0	0	0	9	40	36
05:00	0	0	1	2	12	36	5	0	0	0	0	0	0	56	38	36
06:00	0	0	0	10	60	90	13	1	0	0	0	0	0	174	38	35
07:00	0	0	0	9	121	156	38	4	0	0	0	0	0	328	38	36
08:00	0	0	0	3	98	203	40	1	0	0	0	0	0	345	38	36
09:00	0	0	0	3	75	203	35	3	0	0	0	0	0	319	38	36
10:00	0	0	0	5	76	138	28	1	0	0	0	0	0	248	38	36
11:00	0	0	0	2	85	162	34	3	0	0	0	0	0	286	38	36
12 PM	0	1	0	4	83	188	39	4	0	0	0	0	0	319	38	36
13:00	0	1	3	8	77	162	40	4	0	0	0	0	0	295	38	36
14:00	1	0	0	15	106	212	44	0	0	0	0	0	0	378	38	36
15:00	0	0	0	15	161	254	51	1	0	0	0	0	0	482	38	36
16:00	0	0	0	2	187	327	49	4	0	0	0	0	0	569	38	36
17:00	0	0	1	18	213	248	17	1	0	0	0	0	0	498	37	35
18:00	0	0	7	25	195	152	17	0	0	0	0	0	0	396	37	34
19:00	0	0	1	7	116	98	17	3	0	0	0	0	0	242	38	35
20:00	0	0	1	4	44	102	17	1	0	0	0	0	0	169	38	36
21:00	0	0	1	3	40	82	8	1	0	0	0	0	0	135	38	36
22:00	0	0	0	4	30	46	10	0	0	0	0	0	0	90	38	35
23:00	0	0	0	0	18	28	11	1	0	0	0	0	0	58	40	37
Total	1	2	15	140	1807	2913	522	39	1	0	0	0	0	5440		
%	0.0%	0.0%	0.3%	2.6%	33.2%	53.5%	9.6%	0.7%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak Vol.			05:00 1	06:00 10	07:00 121	08:00 203	08:00 40	07:00 4	02:00 1					08:00 345		
Midda y Peak Vol.	14:00 1	12:00 1	13:00 3	14:00 15	14:00 106	14:00 212	14:00 44	12:00 4						14:00 378		
PM Peak Vol.			18:00 7	18:00 25	17:00 213	16:00 327	15:00 51	16:00 4						16:00 569		
% ile			15th Percentile :			30 MPH										
			50th Percentile :			35 MPH										
			85th Percentile :			38 MPH										
			95th Percentile :			41 MPH										

Stats 10 MPH Pace Speed : 30-39 MPH
 Number in Pace : 4720
 Percent in Pace : 86.8%
 Number of Vehicles > 35 MPH : 2892
 Percent of Vehicles > 35 MPH : 53.2%
 Mean Speed(Average) : 36 MPH

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Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
10/31/																
15	0	0	0	0	7	7	6	0	0	0	0	0	0	20	41	37
01:00	0	0	0	0	8	5	2	0	0	0	0	0	0	15	38	35
02:00	0	0	0	0	2	4	2	1	0	0	0	0	0	9	43	38
03:00	0	0	0	0	2	0	0	0	0	0	0	0	0	2	33	32
04:00	0	0	0	2	1	3	2	1	0	0	0	0	0	9	43	36
05:00	0	0	0	1	3	11	4	0	0	0	0	0	0	19	40	37
06:00	0	0	0	5	9	20	8	2	0	0	0	0	0	44	41	36
07:00	0	0	0	6	35	61	20	3	0	0	0	0	0	125	40	36
08:00	0	0	0	11	42	117	22	1	0	0	0	0	0	193	38	36
09:00	0	1	3	2	45	163	45	3	0	0	0	0	0	262	39	37
10:00	0	1	3	8	57	181	44	4	0	0	0	0	0	298	39	36
11:00	0	0	1	0	57	190	52	3	1	0	0	0	0	304	40	37
12 PM	0	0	1	9	80	185	56	1	0	0	0	0	0	332	39	36
13:00	0	0	1	2	92	186	59	6	0	0	0	0	0	346	40	37
14:00	1	1	5	7	101	178	33	5	0	0	0	0	0	331	38	36
15:00	0	0	1	10	92	197	43	0	0	0	0	0	0	343	38	36
16:00	0	0	0	9	120	177	39	0	0	0	0	0	0	345	38	36
17:00	0	0	0	7	112	133	21	2	0	0	0	0	0	275	38	35
18:00	0	1	1	3	93	76	17	2	0	0	0	0	0	193	38	35
19:00	0	0	2	8	43	77	16	0	0	0	0	0	0	146	38	35
20:00	0	0	1	11	41	65	14	0	0	0	0	0	0	132	38	35
21:00	0	0	0	3	35	67	9	1	0	0	0	0	0	115	38	36
22:00	0	0	0	6	41	46	9	0	0	0	0	0	0	102	38	35
23:00	0	0	0	1	21	32	7	1	1	0	0	0	0	63	38	36
Total	1	4	19	111	1139	2181	530	36	2	0	0	0	0	4023		
%	0.0%	0.1%	0.5%	2.8%	28.3%	54.2%	13.2%	0.9%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak		09:00	09:00	08:00	09:00	09:00	09:00	07:00						09:00		
Vol.		1	3	11	45	163	45	3						262		
Midda y Peak	14:00	14:00	14:00	12:00	14:00	11:00	13:00	13:00	11:00					13:00		
Vol.	1	1	5	9	101	190	59	6	1					346		
PM Peak		18:00	19:00	20:00	16:00	15:00	15:00	17:00	23:00					16:00		
Vol.		1	2	11	120	197	43	2	1					345		
% ile				15th Percentile :		31 MPH										
				50th Percentile :		35 MPH										
				85th Percentile :		38 MPH										
				95th Percentile :		42 MPH										

Stats 10 MPH Pace Speed : 30-39 MPH
 Number in Pace : 3320
 Percent in Pace : 82.5%
 Number of Vehicles > 35 MPH : 2313
 Percent of Vehicles > 35 MPH : 57.5%
 Mean Speed(Average) : 36 MPH

Parker Street (Route 27)
south of B Street
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Client: Green/ J. Gauvin



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154779 A Speed
Site Code: 15104
Date Start: 30-Oct-15

SB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
10/30/																
15	0	0	0	2	5	6	6	1	0	0	0	0	0	20	42	37
01:00	0	0	0	2	2	2	2	0	0	0	0	0	0	8	41	34
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	0	0	3	1	2	0	0	0	0	0	0	6	41	36
04:00	0	0	0	4	9	13	0	0	0	0	0	0	0	26	37	34
05:00	0	0	0	7	38	48	7	0	0	0	0	0	0	100	38	35
06:00	0	0	2	14	187	163	27	0	0	0	0	0	0	393	38	35
07:00	0	0	12	44	217	199	29	3	0	0	0	0	0	504	37	34
08:00	0	0	0	22	140	217	45	2	0	0	0	0	0	426	38	35
09:00	0	0	1	5	119	222	42	3	0	0	0	0	0	392	38	36
10:00	0	0	1	10	83	180	40	9	0	0	0	0	0	323	39	36
11:00	0	0	1	11	90	147	51	1	0	0	0	0	0	301	39	36
12 PM	1	4	1	6	82	176	30	5	0	0	0	0	0	305	38	36
13:00	0	0	4	14	103	139	41	2	0	0	0	0	0	303	38	35
14:00	0	1	9	12	118	165	27	0	0	0	0	0	0	332	38	35
15:00	0	0	3	24	110	174	41	2	0	0	0	0	0	354	38	35
16:00	0	0	1	15	138	209	27	0	0	0	0	0	0	390	38	35
17:00	0	0	5	55	199	179	33	2	0	0	0	0	0	473	37	34
18:00	0	0	1	5	150	144	18	0	1	1	0	0	0	320	38	35
19:00	0	0	0	6	61	117	18	2	0	0	0	0	0	204	38	36
20:00	0	0	0	4	36	61	12	0	0	0	0	0	0	113	38	36
21:00	0	0	1	3	29	63	10	2	0	0	0	0	0	108	38	36
22:00	0	0	0	4	39	40	7	0	0	0	0	0	0	90	38	35
23:00	0	0	0	0	13	18	6	0	0	0	0	0	0	37	39	36
Total	1	5	42	269	1971	2683	521	34	1	1	0	0	0	5528		
%	0.0%	0.1%	0.8%	4.9%	35.7%	48.5%	9.4%	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak			07:00	07:00	07:00	09:00	08:00	07:00						07:00		
Vol.			12	44	217	222	45	3						504		
Midda y Peak	12:00	12:00	14:00	13:00	14:00	12:00	11:00	12:00						14:00		
Vol.	1	4	9	14	118	176	51	5						332		
PM Peak			17:00	17:00	17:00	16:00	15:00	15:00	18:00	18:00				17:00		
Vol.			5	55	199	209	41	2	1	1				473		
% ile			15th Percentile :			30 MPH										
			50th Percentile :			34 MPH										
			85th Percentile :			38 MPH										
			95th Percentile :			41 MPH										

Stats 10 MPH Pace Speed : 30-39 MPH
 Number in Pace : 4654
 Percent in Pace : 84.2%
 Number of Vehicles > 35 MPH : 2703
 Percent of Vehicles > 35 MPH : 48.9%
 Mean Speed(Average) : 35 MPH

Parker Street (Route 27)
south of B Street
City, State: Maynard, MA
Client: Green/ J. Gauvin



PRECISION
D A T A
INDUSTRIES, LLC

P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
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154779 A Speed
Site Code: 15104
Date Start: 30-Oct-15

SB

Start Time	14	15	19	20	24	25	29	30	34	35	39	40	44	45	49	50	54	55	59	60	64	65	69	70	9999	Total	85th % ile	Ave Speed
10/31/																												
15	0	0	0	0	0	9	6	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17	38	35
01:00	0	0	0	0	0	4	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	41	36
02:00	0	0	0	0	0	0	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	41	38
03:00	0	0	0	0	0	0	1	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	50	44
04:00	0	0	0	0	2	3	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	39	35
05:00	0	0	0	0	1	10	12	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	28	40	36
06:00	0	0	0	0	1	23	49	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	83	38	36
07:00	0	0	1	3	37	80	18	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	145	39	36
08:00	0	0	1	7	64	134	35	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	245	39	36
09:00	0	0	1	2	52	173	30	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	264	38	37
10:00	0	0	1	7	91	183	60	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	343	39	36
11:00	0	0	0	6	104	189	62	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	365	39	36
12 PM	0	0	3	6	92	208	48	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	362	38	36
13:00	0	0	3	12	115	202	35	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	368	38	35
14:00	0	0	3	17	108	180	33	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	344	38	35
15:00	0	1	4	13	111	191	36	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	357	38	35
16:00	0	0	1	11	130	173	20	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	337	38	35
17:00	0	0	1	7	113	118	14	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	255	38	35
18:00	0	1	2	12	90	66	12	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	184	37	34
19:00	0	0	1	11	68	31	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	117	37	33
20:00	0	0	2	10	46	46	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	111	37	34
21:00	0	0	0	1	38	37	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	82	38	35
22:00	0	0	0	2	24	29	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	62	38	35
23:00	0	0	1	3	17	20	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	47	38	35
Total	0	2	25	134	1349	2138	456	38	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4146		
%	0.0%	0.0%	0.6%	3.2%	32.5%	51.6%	11.0%	0.9%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak			07:00	08:00	08:00	09:00	08:00	07:00	08:00																	09:00		
Vol.			1	7	64	173	35	6	2																	264		
Midda y Peak			12:00	14:00	13:00	12:00	11:00	12:00																		13:00		
Vol.			3	17	115	208	62	5																		368		
PM Peak		15:00	15:00	15:00	16:00	15:00	15:00	16:00																		15:00		
Vol.		1	4	13	130	191	36	2																		357		
% ile				15th Percentile :				30 MPH																				
				50th Percentile :				35 MPH																				
				85th Percentile :				38 MPH																				
				95th Percentile :				42 MPH																				

Stats 10 MPH Pace Speed : 30-39 MPH
 Number in Pace : 3487
 Percent in Pace : 84.1%
 Number of Vehicles > 35 MPH : 2208
 Percent of Vehicles > 35 MPH : 53.3%
 Mean Speed(Average) : 36 MPH

Parker Street (Route 27)
south of B Street
City, State: Maynard, MA
Client: Green/ J. Gauvin



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154779 A Volume
Site Code: 15104
Date Start: 30-Oct-15

Start	NB				SB				Combin	30-Oct-15			
Time	A.M.		P.M.		A.M.		P.M.		A.M.	P.M.			Fri
12:00	1		89		5		76		6	165			
12:15	9		85		6		77		15	162			
12:30	7		69		5		86		12	155			
12:45	5	22	76	319	4	20	66	305	9	42	142	624	
01:00	5		64		5		97		10	161			
01:15	4		73		0		80		4	153			
01:30	4		65		2		74		6	139			
01:45	0	13	93	295	1	8	52	303	1	21	145	598	
02:00	1		88		0		78		1	166			
02:15	3		81		0		75		3	156			
02:30	1		94		0		91		1	185			
02:45	1	6	115	378	0	0	88	332	1	6	203	710	
03:00	0		113		0		79		0	192			
03:15	0		140		2		86		2	226			
03:30	2		95		2		97		4	192			
03:45	1	3	134	482	2	6	92	354	3	9	226	836	
04:00	0		150		4		91		4	241			
04:15	1		138		7		101		8	239			
04:30	3		148		7		116		10	264			
04:45	5	9	133	569	8	26	82	390	13	35	215	959	
05:00	5		122		16		115		21	237			
05:15	6		129		16		113		22	242			
05:30	15		137		31		115		46	252			
05:45	30	56	110	498	37	100	130	473	67	156	240	971	
06:00	27		112		68		106		95	218			
06:15	45		108		87		70		132	178			
06:30	43		88		134		81		177	169			
06:45	59	174	88	396	104	393	63	320	163	567	151	716	
07:00	64		84		121		62		185	146			
07:15	76		55		133		51		209	106			
07:30	99		40		141		47		240	87			
07:45	89	328	63	242	109	504	44	204	198	832	107	446	
08:00	99		46		127		32		226	78			
08:15	77		51		100		27		177	78			
08:30	90		36		119		19		209	55			
08:45	79	345	36	169	80	426	35	113	159	771	71	282	
09:00	95		35		111		29		206	64			
09:15	87		33		94		26		181	59			
09:30	75		31		102		17		177	48			
09:45	62	319	36	135	85	392	36	108	147	711	72	243	
10:00	51		26		89		21		140	47			
10:15	71		29		77		28		148	57			
10:30	67		19		81		27		148	46			
10:45	59	248	16	90	76	323	14	90	135	571	30	180	
11:00	68		19		84		10		152	29			
11:15	66		16		57		12		123	28			
11:30	87		15		94		7		181	22			
11:45	65	286	8	58	66	301	8	37	131	587	16	95	
Total	1809		3631		2499		3029		4308		6660		
Percent	42.0%		54.5%		58.0%		45.5%						
Day Total		5440				5528				10968			
Peak	07:30	-	03:45	-	07:15	-	05:00	-	07:15	-	05:00	-	-
Vol.	364	-	570	-	510	-	473	-	873	-	971	-	-
P.H.F.	0.919		0.950		0.904		0.910		0.909		0.920		

Parker Street (Route 27)
south of B Street
City, State: Maynard, MA
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154779 A Volume
Site Code: 15104
Date Start: 30-Oct-15

Start	NB				SB				Combined		31-Oct-15 Sat	
Time	A.M.		P.M.		A.M.	P.M.			A.M.	P.M.		
12:00	5		87		10	88			15	175		
12:15	4		89		3	84			7	173		
12:30	4		86		3	84			7	170		
12:45	7	20	70	332	1	17	106	362	8	176	694	
01:00	5		85		3		91		8	176		
01:15	3		86		5		106		8	192		
01:30	4		81		2		84		6	165		
01:45	3	15	94	346	0	10	87	368	3	181	714	
02:00	2		77		2		95		4	172		
02:15	2		96		1		95		3	191		
02:30	2		80		1		75		3	155		
02:45	3	9	78	331	0	4	79	344	3	157	675	
03:00	1		76		1		88		2	164		
03:15	0		96		0		92		0	188		
03:30	1		89		4		95		5	184		
03:45	0	2	82	343	0	5	82	357	0	164	700	
04:00	3		90		5		104		8	194		
04:15	3		100		0		67		3	167		
04:30	1		69		5		96		6	165		
04:45	2	9	86	345	1	11	70	337	3	156	682	
05:00	5		69		1		74		6	143		
05:15	1		67		3		69		4	136		
05:30	4		74		17		62		21	136		
05:45	9	19	65	275	7	28	50	255	16	115	530	
06:00	10		63		19		61		29	124		
06:15	11		50		14		51		25	101		
06:30	10		38		23		40		33	78		
06:45	13	44	42	193	27	83	32	184	40	74	377	
07:00	28		32		27		23		55	55		
07:15	35		32		37		28		72	60		
07:30	33		42		39		29		72	71		
07:45	29	125	40	146	42	145	37	117	71	77	263	
08:00	41		31		43		32		84	63		
08:15	41		36		63		33		104	69		
08:30	49		41		71		28		120	69		
08:45	62	193	24	132	68	245	18	111	130	42	243	
09:00	55		29		49		23		104	52		
09:15	90		29		59		24		149	53		
09:30	46		26		69		19		115	45		
09:45	71	262	31	115	87	264	16	82	158	47	197	
10:00	67		29		96		13		163	42		
10:15	79		31		75		17		154	48		
10:30	60		24		75		17		135	41		
10:45	92	298	18	102	97	343	15	62	189	33	164	
11:00	57		11		76		15		133	26		
11:15	73		19		110		11		183	30		
11:30	88		17		84		8		172	25		
11:45	86	304	16	63	95	365	13	47	181	29	110	
Total	1300		2723		1520		2626		2820	5349		
Percent	46.1%		50.9%		53.9%		49.1%					
Day Total		4023				4146				8169		
Peak	10:45	-	03:30	-	10:45	-	00:30	-	10:45	-	03:15	-
Vol.	310	-	361	-	367	-	387	-	677	-	730	-
P.H.F.	0.842		0.903		0.834		0.913		0.896		0.941	

**Parker Street (Route 27), south of B Street
Maynard, MA**

ATR Data Summary

ATR Data Summary									Friday			Directional			Saturday			Directional					
									Hourly Volumes			Distribution			Hourly Volumes			Distribution					
									NB	SB	Both	NB	SB	K-Factor	NB	SB	Both	NB	SB	K-Factor			
			Fri, Oct 30, 2015		Sat, Oct 31, 2015																		
12:00 AM	to	12:15 AM	1	5	6	5	10	15.0															
12:15 AM	to	12:30 AM	9	6	15	4	3	7															
12:30 AM	to	12:45 AM	7	5	12	4	3	7															
12:45 AM	to	01:00 AM	5	4	9	7	1	8	12:00 AM	to	01:00 AM	22.0	20.0	42.0	52.381%	47.619%	0.003829	20.0	17.0	37.0	54.054%	45.946%	0.004529
01:00 AM	to	01:15 AM	5	5	10	5	3	8	12:15 AM	to	01:15 AM	26.0	20.0	46.0	56.522%	43.478%	0.004194	20.0	10.0	30.0	66.667%	33.333%	0.003672
01:15 AM	to	01:30 AM	4	0	4	3	5	8	12:30 AM	to	01:30 AM	21.0	14.0	35.0	60.000%	40.000%	0.003191	19.0	12.0	31.0	61.290%	38.710%	0.003795
01:30 AM	to	01:45 AM	4	2	6	4	2	6	12:45 AM	to	01:45 AM	18.0	11.0	29.0	62.069%	37.931%	0.002644	19.0	11.0	30.0	63.333%	36.667%	0.003672
01:45 AM	to	02:00 AM	0	1	1	3	0	3	01:00 AM	to	02:00 AM	13.0	8.0	21.0	61.905%	38.095%	0.001915	15.0	10.0	25.0	60.000%	40.000%	0.003060
02:00 AM	to	02:15 AM	1	0	1	2	2	4	01:15 AM	to	02:15 AM	9.0	3.0	12.0	75.000%	25.000%	0.001094	12.0	9.0	21.0	57.143%	42.857%	0.002571
02:15 AM	to	02:30 AM	3	0	3	2	1	3	01:30 AM	to	02:30 AM	8.0	3.0	11.0	72.727%	27.273%	0.001003	11.0	5.0	16.0	68.750%	31.250%	0.001959
02:30 AM	to	02:45 AM	1	0	1	2	1	3	01:45 AM	to	02:45 AM	5.0	1.0	6.0	83.333%	16.667%	0.000547	9.0	4.0	13.0	69.231%	30.769%	0.001591
02:45 AM	to	03:00 AM	1	0	1	3	0	3	02:00 AM	to	03:00 AM	6.0	0.0	6.0	100.000%	0.000%	0.000547	9.0	4.0	13.0	69.231%	30.769%	0.001591
03:00 AM	to	03:15 AM	0	0	0	1	1	2	02:15 AM	to	03:15 AM	5.0	0.0	5.0	100.000%	0.000%	0.000456	8.0	3.0	11.0	72.727%	27.273%	0.001347
03:15 AM	to	03:30 AM	0	2	2	0	0	0	02:30 AM	to	03:30 AM	2.0	2.0	4.0	50.000%	50.000%	0.000365	6.0	2.0	8.0	75.000%	25.000%	0.000979
03:30 AM	to	03:45 AM	2	2	4	1	4	5	02:45 AM	to	03:45 AM	3.0	4.0	7.0	42.857%	57.143%	0.000638	5.0	5.0	10.0	50.000%	50.000%	0.001224
03:45 AM	to	04:00 AM	1	2	3	0	0	0	03:00 AM	to	04:00 AM	3.0	6.0	9.0	33.333%	66.667%	0.000821	2.0	5.0	7.0	28.571%	71.429%	0.000857
04:00 AM	to	04:15 AM	0	4	4	3	5	8	03:15 AM	to	04:15 AM	3.0	10.0	13.0	23.077%	76.923%	0.001185	4.0	9.0	13.0	30.769%	69.231%	0.001591
04:15 AM	to	04:30 AM	1	7	8	3	0	3	03:30 AM	to	04:30 AM	4.0	15.0	19.0	21.053%	78.947%	0.001732	7.0	9.0	16.0	43.750%	56.250%	0.001959
04:30 AM	to	04:45 AM	3	7	10	1	5	6	03:45 AM	to	04:45 AM	5.0	20.0	25.0	20.000%	80.000%	0.002279	7.0	10.0	17.0	41.176%	58.824%	0.002081
04:45 AM	to	05:00 AM	5	8	13	2	1	3	04:00 AM	to	05:00 AM	9.0	26.0	35.0	25.714%	74.286%	0.003191	9.0	11.0	20.0	45.000%	55.000%	0.002448
05:00 AM	to	05:15 AM	5	16	21	5	1	6	04:15 AM	to	05:15 AM	14.0	38.0	52.0	26.923%	73.077%	0.004741	11.0	7.0	18.0	61.111%	38.889%	0.002203
05:15 AM	to	05:30 AM	6	16	22	1	3	4	04:30 AM	to	05:30 AM	19.0	47.0	66.0	28.788%	71.212%	0.006018	9.0	10.0	19.0	47.368%	52.632%	0.002326
05:30 AM	to	05:45 AM	15	31	46	4	17	21	04:45 AM	to	05:45 AM	31.0	71.0	102.0	30.392%	69.608%	0.009300	12.0	22.0	34.0	35.294%	64.706%	0.004162
05:45 AM	to	06:00 AM	30	37	67	9	7	16	05:00 AM	to	06:00 AM	56.0	100.0	156.0	35.897%	64.103%	0.014223	19.0	28.0	47.0	40.426%	59.574%	0.005753
06:00 AM	to	06:15 AM	27	68	95	10	19	29	05:15 AM	to	06:15 AM	78.0	152.0	230.0	33.913%	66.087%	0.020970	24.0	46.0	70.0	34.286%	65.714%	0.008569
06:15 AM	to	06:30 AM	45	87	132	11	14	25	05:30 AM	to	06:30 AM	117.0	223.0	340.0	34.412%	65.588%	0.030999	34.0	57.0	91.0	37.363%	62.637%	0.011140
06:30 AM	to	06:45 AM	43	134	177	10	23	33	05:45 AM	to	06:45 AM	145.0	326.0	471.0	30.786%	69.214%	0.042943	40.0	63.0	103.0	38.835%	61.165%	0.012609
06:45 AM	to	07:00 AM	59	104	163	13	27	40	06:00 AM	to	07:00 AM	174.0	393.0	567.0	30.688%	69.312%	0.051696	44.0	83.0	127.0	34.646%	65.354%	0.015547
07:00 AM	to	07:15 AM	64	121	185	28	27	55	06:15 AM	to	07:15 AM	211.0	446.0	657.0	32.116%	67.884%	0.059902	62.0	91.0	153.0	40.523%	59.477%	0.018729
07:15 AM	to	07:30 AM	76	133	209	35	37	72	06:30 AM	to	07:30 AM	242.0	492.0	734.0	32.970%	67.030%	0.066922	86.0	114.0	200.0	43.000%	57.000%	0.024483
07:30 AM	to	07:45 AM	99	141	240	33	39	72	06:45 AM	to	07:45 AM	298.0	499.0	797.0	37.390%	62.610%	0.072666	109.0	130.0	239.0	45.607%	54.393%	0.029257
07:45 AM	to	08:00 AM	89	109	198	29	42	71	07:00 AM	to	08:00 AM	328.0	504.0	832.0	39.423%	60.577%	0.075857	125.0	145.0	270.0	46.296%	53.704%	0.033052
08:00 AM	to	08:15 AM	99	127	226	41	43	84	07:15 AM	to	08:15 AM	363.0	510.0	873.0	41.581%	58.419%	0.079595	138.0	161.0	299.0	46.154%	53.846%	0.036602
08:15 AM	to	08:30 AM	77	100	177	41	63	104	07:30 AM	to	08:30 AM	364.0	477.0	841.0	43.282%	56.718%	0.076678	144.0	187.0	331.0	43.505%	56.495%	0.040519
08:30 AM	to	08:45 AM	90	119	209	49	71	120	07:45 AM	to	08:45 AM	355.0	455.0	810.0	43.827%	56.173%	0.073851	160.0	219.0	379.0	42.216%	57.784%	0.046395
08:45 AM	to	09:00 AM	79	80	159	62	68	130	08:00 AM	to	09:00 AM	345.0	426.0	771.0	44.747%	55.253%	0.070295	193.0	245.0	438.0	44.064%	55.936%	0.053617
09:00 AM	to	09:15 AM	95	111	206	55	49	104	08:15 AM	to	09:15 AM	341.0	410.0	751.0	45.406%	54.594%	0.068472	207.0	251.0	458.0	45.197%	54.803%	0.056066
09:15 AM	to	09:30 AM	87	94	181	90	59	149	08:30 AM	to	09:30 AM	351.0	404.0	755.0	46.490%	53.510%	0.068837	256.0	247.0	503.0	50.895%	49.105%	0.061574
09:30 AM	to	09:45 AM	75	102	177	46	69	115	08:45 AM	to	09:45 AM	336.0	387.0	723.0	46.473%	53.527%	0.065919	253.0	245.0	498.0	50.803%	49.197%	0.060962
09:45 AM	to	10:00 AM	62	85	147	71	87	158	09:00 AM	to	10:00 AM	319.0	392.0	711.0	44.866%	55.134%	0.064825	262.0	264.0	526.0	49.810%	50.190%	0.064390
10:00 AM	to	10:15 AM	51	89	140	67	96	163	09:15 AM	to	10:15 AM	275.0	370.0	645.0	42.636%	57.364%	0.058807	274.0	311.0	585.0	46.838%	53.162%	0.071612
10:15 AM	to	10:30 AM	71	77	148	79	75	154	09:30 AM	to	10:30 AM	259.0	353.0	612.0	42.320%	57.680%	0.055799	263.0	327.0	590.0	44.576%	55.424%	0.072224
10:30 AM	to	10:45 AM	67	81	148	60	75	135	09:45 AM	to	10:45 AM	251.0	332.0	583.0	43.053%	56.947%	0.053155	277.0	333.0	610.0	45.410%	54.590%	0.074673
10:45 AM	to	11:00 AM	59	76	135	92	97	189	10:00 AM	to	11:00 AM	248.0	323.0	571.0	43.433%	56.567%	0.052061	298.0	343.0	641.0	46.490%	53.510%	0.078467
11:00 AM	to	11:15 AM	68	84	152	57	76	133	10:15 AM	to	11:15 AM	265.0	318.0	583.0	45.455%	54.545%	0.053155	288.0	323.0	611.0	47.136%	52.864%	0.074795
11:15 AM	to	11:30 AM	66	57	123	73	110	183	10:30 AM	to	11:30 AM	260.0	298.0	558.0	46.595%	53.405%	0.050875	282.0	358.0	640.0	44.063%	55.938%	0.078345
11:30 AM	to	11:45 AM	87	94	181	88	84	172	10:45 AM	to	11:45 AM	280.0	311.0	591.0	47.377%	52.623%	0.053884						

**Parker Street (Route 27), south of B Street
Maynard, MA**

ATR Data Summary

ATR Data Summary												Friday			Directional						Saturday			Directional					
												Hourly Volumes			Distribution						Hourly Volumes			Distribution					
			Fri, Oct 30, 2015			Sat, Oct 31, 2015																							
			NB	SB	Both	NB	SB	Both				NB	SB	Both	NB	SB	K-Factor	NB	SB	Both	NB	SB	K-Factor						
12:45 PM	to	01:00 PM	76	66	142	70	106	176	12:00 PM	to	01:00 PM	319.0	305.0	624.0	51.122%	48.878%	0.056893	332.0	362.0	694.0	47.839%	52.161%	0.084955						
01:00 PM	to	01:15 PM	64	97	161	85	91	176	12:15 PM	to	01:15 PM	294.0	326.0	620.0	47.419%	52.581%	0.056528	330.0	365.0	695.0	47.482%	52.518%	0.085078						
01:15 PM	to	01:30 PM	73	80	153	86	106	192	12:30 PM	to	01:30 PM	282.0	329.0	611.0	46.154%	53.846%	0.055708	327.0	387.0	714.0	45.798%	54.202%	0.087404						
01:30 PM	to	01:45 PM	65	74	139	81	84	165	12:45 PM	to	01:45 PM	278.0	317.0	595.0	46.723%	53.277%	0.054249	322.0	387.0	709.0	45.416%	54.584%	0.086792						
01:45 PM	to	02:00 PM	93	52	145	94	87	181	01:00 PM	to	02:00 PM	295.0	303.0	598.0	49.331%	50.669%	0.054522	346.0	368.0	714.0	48.459%	51.541%	0.087404						
02:00 PM	to	02:15 PM	88	78	166	77	95	172	01:15 PM	to	02:15 PM	319.0	284.0	603.0	52.902%	47.098%	0.054978	338.0	372.0	710.0	47.606%	52.394%	0.086914						
02:15 PM	to	02:30 PM	81	75	156	96	95	191	01:30 PM	to	02:30 PM	327.0	279.0	606.0	53.960%	46.040%	0.055252	348.0	361.0	709.0	49.083%	50.917%	0.086792						
02:30 PM	to	02:45 PM	94	91	185	80	75	155	01:45 PM	to	02:45 PM	356.0	296.0	652.0	54.601%	45.399%	0.059446	347.0	352.0	699.0	49.642%	50.358%	0.085567						
02:45 PM	to	03:00 PM	115	88	203	78	79	157	02:00 PM	to	03:00 PM	378.0	332.0	710.0	53.239%	46.761%	0.064734	331.0	344.0	675.0	49.037%	50.963%	0.082629						
03:00 PM	to	03:15 PM	113	79	192	76	88	164	02:15 PM	to	03:15 PM	403.0	333.0	736.0	54.755%	45.245%	0.067104	330.0	337.0	667.0	49.475%	50.525%	0.081650						
03:15 PM	to	03:30 PM	140	86	226	96	92	188	02:30 PM	to	03:30 PM	462.0	344.0	806.0	57.320%	42.680%	0.073487	330.0	334.0	664.0	49.699%	50.301%	0.081283						
03:30 PM	to	03:45 PM	95	97	192	89	95	184	02:45 PM	to	03:45 PM	463.0	350.0	813.0	56.950%	43.050%	0.074125	339.0	354.0	693.0	48.918%	51.082%	0.084833						
03:45 PM	to	04:00 PM	134	92	226	82	82	164	03:00 PM	to	04:00 PM	482.0	354.0	836.0	57.656%	42.344%	0.076222	343.0	357.0	700.0	49.000%	51.000%	0.085690						
04:00 PM	to	04:15 PM	150	91	241	90	104	194	03:15 PM	to	04:15 PM	519.0	366.0	885.0	58.644%	41.356%	0.080689	357.0	373.0	730.0	48.904%	51.096%	0.089362						
04:15 PM	to	04:30 PM	138	101	239	100	67	167	03:30 PM	to	04:30 PM	517.0	381.0	898.0	57.572%	42.428%	0.081875	361.0	348.0	709.0	50.917%	49.083%	0.086792						
04:30 PM	to	04:45 PM	148	116	264	69	96	165	03:45 PM	to	04:45 PM	570.0	400.0	970.0	58.763%	41.237%	0.088439	341.0	349.0	690.0	49.420%	50.580%	0.084466						
04:45 PM	to	05:00 PM	133	82	215	86	70	156	04:00 PM	to	05:00 PM	569.0	390.0	959.0	59.333%	40.667%	0.087436	345.0	337.0	682.0	50.587%	49.413%	0.083486						
05:00 PM	to	05:15 PM	122	115	237	69	74	143	04:15 PM	to	05:15 PM	541.0	414.0	955.0	56.649%	43.351%	0.087071	324.0	307.0	631.0	51.347%	48.653%	0.077243						
05:15 PM	to	05:30 PM	129	113	242	67	69	136	04:30 PM	to	05:30 PM	532.0	426.0	958.0	55.532%	44.468%	0.087345	291.0	309.0	600.0	48.500%	51.500%	0.073448						
05:30 PM	to	05:45 PM	137	115	252	74	62	136	04:45 PM	to	05:45 PM	521.0	425.0	946.0	55.074%	44.926%	0.086251	296.0	275.0	571.0	51.839%	48.161%	0.069898						
05:45 PM	to	06:00 PM	110	130	240	65	50	115	05:00 PM	to	06:00 PM	498.0	473.0	971.0	51.287%	48.713%	0.088530	275.0	255.0	530.0	51.887%	48.113%	0.064879						
06:00 PM	to	06:15 PM	112	106	218	63	61	124	05:15 PM	to	06:15 PM	488.0	464.0	952.0	51.261%	48.739%	0.086798	269.0	242.0	511.0	52.642%	47.358%	0.062554						
06:15 PM	to	06:30 PM	108	70	178	50	51	101	05:30 PM	to	06:30 PM	467.0	421.0	888.0	52.590%	47.410%	0.080963	252.0	224.0	476.0	52.941%	47.059%	0.058269						
06:30 PM	to	06:45 PM	88	81	169	38	40	78	05:45 PM	to	06:45 PM	418.0	387.0	805.0	51.925%	48.075%	0.073395	216.0	202.0	418.0	51.675%	48.325%	0.051169						
06:45 PM	to	07:00 PM	88	63	151	42	32	74	06:00 PM	to	07:00 PM	396.0	320.0	716.0	55.307%	44.693%	0.065281	193.0	184.0	377.0	51.194%	48.806%	0.046150						
07:00 PM	to	07:15 PM	84	62	146	32	23	55	06:15 PM	to	07:15 PM	368.0	276.0	644.0	57.143%	42.857%	0.058716	162.0	146.0	308.0	52.597%	47.403%	0.037704						
07:15 PM	to	07:30 PM	55	51	106	32	28	60	06:30 PM	to	07:30 PM	315.0	257.0	572.0	55.070%	44.930%	0.052152	144.0	123.0	267.0	53.933%	46.067%	0.032685						
07:30 PM	to	07:45 PM	40	47	87	42	29	71	06:45 PM	to	07:45 PM	267.0	223.0	490.0	54.490%	45.510%	0.044675	148.0	112.0	260.0	56.923%	43.077%	0.031828						
07:45 PM	to	08:00 PM	63	44	107	40	37	77	07:00 PM	to	08:00 PM	242.0	204.0	446.0	54.260%	45.740%	0.040664	146.0	117.0	263.0	55.513%	44.487%	0.032195						
08:00 PM	to	08:15 PM	46	32	78	31	32	63	07:15 PM	to	08:15 PM	204.0	174.0	378.0	53.968%	46.032%	0.034464	145.0	126.0	271.0	53.506%	46.494%	0.033174						
08:15 PM	to	08:30 PM	51	27	78	36	33	69	07:30 PM	to	08:30 PM	200.0	150.0	350.0	57.143%	42.857%	0.031911	149.0	131.0	280.0	53.214%	46.786%	0.034276						
08:30 PM	to	08:45 PM	36	19	55	41	28	69	07:45 PM	to	08:45 PM	196.0	122.0	318.0	61.635%	38.365%	0.028993	148.0	130.0	278.0	53.237%	46.763%	0.034031						
08:45 PM	to	09:00 PM	36	35	71	24	18	42	08:00 PM	to	09:00 PM	169.0	113.0	282.0	59.929%	40.071%	0.025711	132.0	111.0	243.0	54.321%	45.679%	0.029747						
09:00 PM	to	09:15 PM	35	29	64	29	23	52	08:15 PM	to	09:15 PM	158.0	110.0	268.0	58.955%	41.045%	0.024435	130.0	102.0	232.0	56.034%	43.966%	0.028400						
09:15 PM	to	09:30 PM	33	26	59	29	24	53	08:30 PM	to	09:30 PM	140.0	109.0	249.0	56.225%	43.775%	0.022702	123.0	93.0	216.0	56.944%	43.056%	0.026441						
09:30 PM	to	09:45 PM	31	17	48	26	19	45	08:45 PM	to	09:45 PM	135.0	107.0	242.0	55.785%	44.215%	0.022064	108.0	84.0	192.0	56.250%	43.750%	0.023503						
09:45 PM	to	10:00 PM	36	36	72	31	16	47	09:00 PM	to	10:00 PM	135.0	108.0	243.0	55.556%	44.444%	0.022155	115.0	82.0	197.0	58.376%	41.624%	0.024116						
10:00 PM	to	10:15 PM	26	21	47	29	13	42	09:15 PM	to	10:15 PM	126.0	100.0	226.0	55.752%	44.248%	0.020605	115.0	72.0	187.0	61.497%	38.503%	0.022891						
10:15 PM	to	10:30 PM	29	28	57	31	17	48	09:30 PM	to	10:30 PM	122.0	102.0	224.0	54.464%	45.536%	0.020423	117.0	65.0	182.0	64.286%	35.714%	0.022279						
10:30 PM	to	10:45 PM	19	27	46	24	17	41	09:45 PM	to	10:45 PM	110.0	112.0	222.0	49.550%	50.450%	0.020241	115.0	63.0	178.0	64.607%	35.393%	0.021790						
10:45 PM	to	11:00 PM	16	14	30	18	15	33	10:00 PM	to	11:00 PM	90.0	90.0	180.0	50.000%	50.000%	0.016411	102.0	62.0	164.0	62.195%	37.805%	0.020076						
11:00 PM	to	11:15 PM	19	10	29	11	15	26	10:15 PM	to	11:15 PM	83.0	79.0	162.0	51.235%	48.765%	0.014770	84.0	64.0	148.0	56.757%	43.243%	0.018117						
11:15 PM	to	11:30 PM	16	12	28	19	11	30	10:30 PM	to	11:30 PM	70.0	63.0	133.0	52.632%	47.368%	0.012126	72.0	58.0	130.0	55.385%	44.615%	0.015914						
11:30 PM	to	11:45 PM	15	7	22	17	8	25	10:45 PM	to	11:45 PM	66.0	43.0	109.0	60.550%	39.450%	0.009938	65.0	49.0	114.0	57.018%	42.982%	0.013955						
11:45 PM	to	12:00 AM	8	8	16	16	13	29	11:00 PM	to	12:00 AM	58.0	37.0	95.0	61.053%	38.947%	0.008662	63.0	47.0	110.0	57.273%	42.727%	0.013466						
Daily Totals			5,440.0	5,528.0	10,968.0	4,023.0	4,146.0	8,169.0																					



APPENDIX
INTERSECTION CRASH RATE WORKSHEETS

INTERSECTION CRASH RATE WORKSHEET

TOWN : Maynard COUNT DATE : 11/15/2012

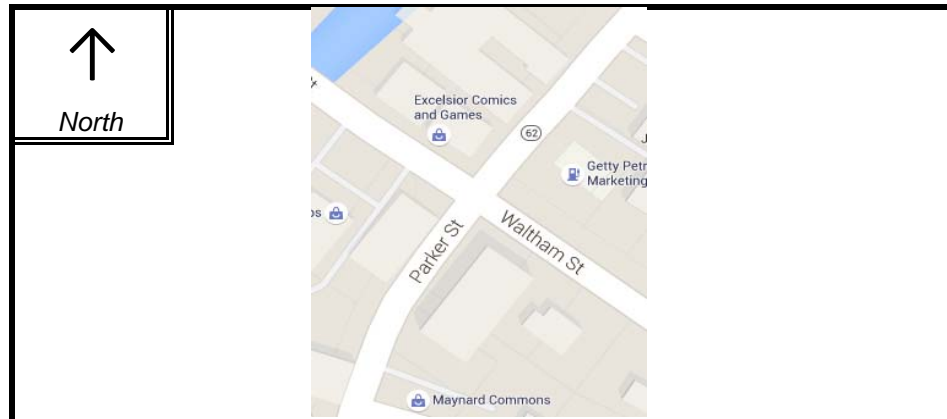
DISTRICT : 3 UNSIGNALIZED : ☒ SIGNALIZED :

~ INTERSECTION DATA ~

MAJOR STREET : Parker Street (Route 27); Powder Mill Road (Route 62)

MINOR STREET(S) : Waltham Street

INTERSECTION DIAGRAM



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	WB	NB	SB		
PEAK HOURLY VOLUMES (PM) :	633	251	301	579		1,764

" K " FACTOR :

0.09

INTERSECTION ADT (V) = TOTAL DAILY
APPROACH VOLUME :

19,600

TOTAL # OF CRASHES :

9

OF
YEARS :

3

AVERAGE # OF
CRASHES PER YEAR (A) :

3.00

CRASH RATE CALCULATION :

0.42

RATE = $\frac{(A * 1,000,000)}{(V * 365)}$

Comments : The average crash rate for signalized intersections in District 3 is 0.89 MEV

Project Title & Date: 15104 - 129 Parker Street, Maynard, MA

INTERSECTION CRASH RATE WORKSHEET

TOWN : Maynard COUNT DATE : 11/15/2012

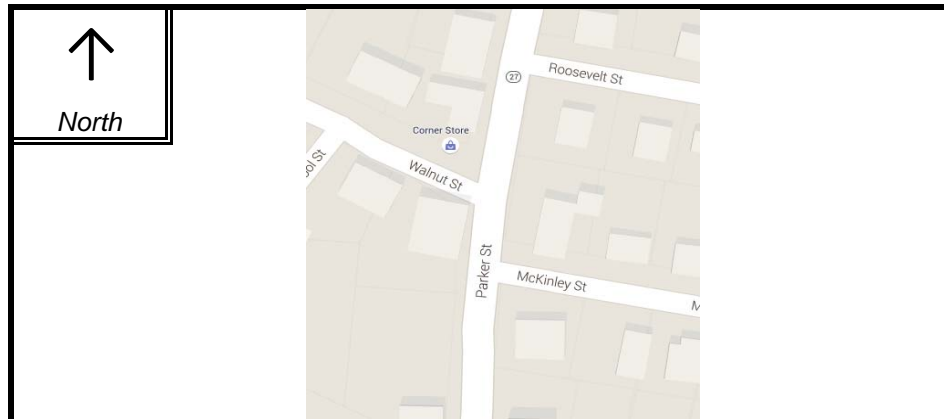
DISTRICT : 3 UNSIGNALIZED : ☒ SIGNALIZED :

~ INTERSECTION DATA ~

MAJOR STREET : Parker Street (Route 27)

MINOR STREET(S) : Walnut Street

INTERSECTION DIAGRAM



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	NB	SB			
PEAK HOURLY VOLUMES (PM) :	181	435	472			1,088

" K " FACTOR :

0.09

INTERSECTION ADT (V) = TOTAL DAILY APPROACH VOLUME :

12,089

TOTAL # OF CRASHES :

5

OF YEARS :

3

AVERAGE # OF CRASHES PER YEAR (A) :

1.67

CRASH RATE CALCULATION :

0.38

RATE = $\frac{(A * 1,000,000)}{(V * 365)}$

Comments : The average crash rate for un-signalized intersections in District 3 is 0.66 MEV

Project Title & Date: 15104-129 Parker Street, Maynard, MA

INTERSECTION CRASH RATE WORKSHEET

TOWN : Maynard COUNT DATE : 11/15/2012

DISTRICT : 3 UNSIGNALIZED : ☒ SIGNALIZED :

~ INTERSECTION DATA ~

MAJOR STREET : Parker Street (Route 27)

MINOR STREET(S) : Old Marlboro Road

INTERSECTION
DIAGRAM



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	WB	NB	SB			
PEAK HOURLY VOLUMES (PM) :	14	554	495			1,063

" K " FACTOR :

0.09

INTERSECTION ADT (V) = TOTAL DAILY
APPROACH VOLUME :

11,811

TOTAL # OF CRASHES :

1

OF
YEARS :

3

AVERAGE # OF
CRASHES PER YEAR (A) :

0.33

CRASH RATE CALCULATION :

0.08

RATE = $\frac{(A * 1,000,000)}{(V * 365)}$

Comments : The average crash rate for un-signalized intersections in District 3 is 0.66 MEV

Project Title & Date : 15113-129 Parker Street, Maynard, MA

INTERSECTION CRASH RATE WORKSHEET

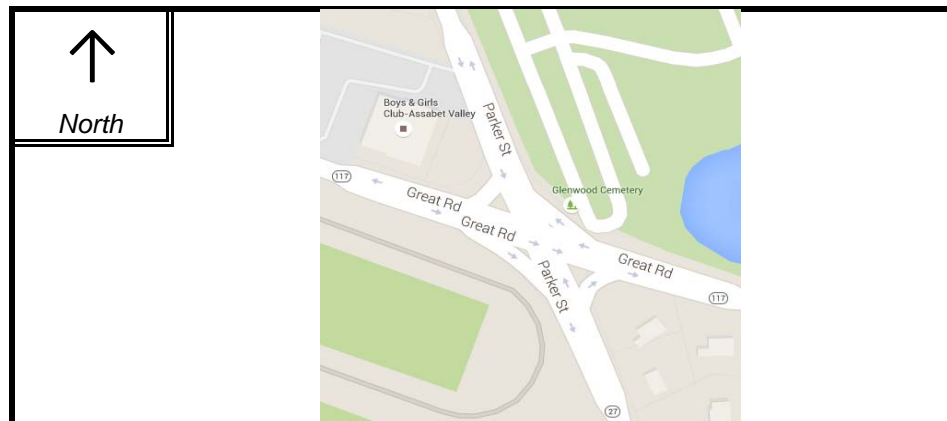
TOWN : Maynard COUNT DATE : 11/15/2012
 DISTRICT : 3 UNSIGNALIZED : ☐ SIGNALIZED : ☒

~ INTERSECTION DATA ~

MAJOR STREET : Great Road (Route 117); Parker Street (Route 27)

MINOR STREET(S) : _____

INTERSECTION DIAGRAM



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	WB	NB	SB		
PEAK HOURLY VOLUMES (PM) :	278	635	555	517		1,985

" K " FACTOR :

0.09

INTERSECTION ADT (V) = TOTAL DAILY
APPROACH VOLUME :

22,056

TOTAL # OF CRASHES :

3

OF
YEARS :

3

AVERAGE # OF
CRASHES PER YEAR (A) :

1.00

CRASH RATE CALCULATION :

0.12

RATE = $\frac{(A * 1,000,000)}{(V * 365)}$

Comments : The average crash rate for signalized intersections in District 3 is 0.89 MEV

Project Title & Date: 15104 - 129 Parker Street, Maynard, MA

INTERSECTION CRASH RATE WORKSHEET

TOWN : Maynard COUNT DATE : 11/15/2012

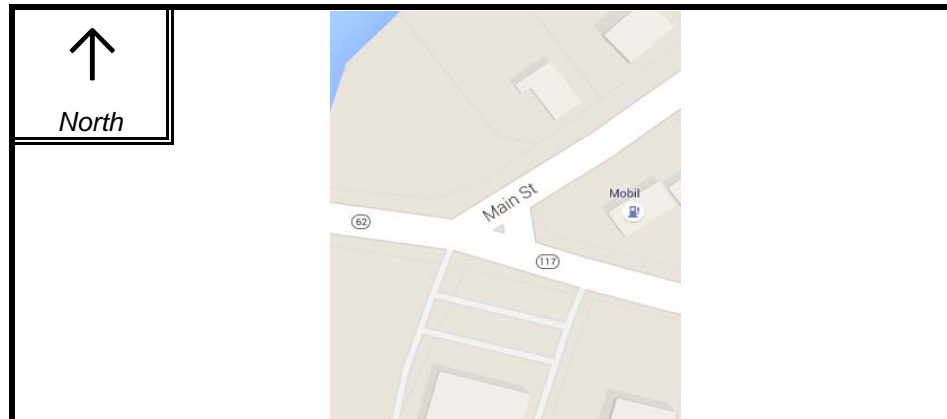
DISTRICT : 3 UNSIGNALIZED : SIGNALIZED : ☒

~ INTERSECTION DATA ~

MAJOR STREET : Great Road (Route 117)

MINOR STREET(S) : Main Street (Route 62)

INTERSECTION
DIAGRAM



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	WB	NB	SB		
PEAK HOURLY VOLUMES (PM) :	389	663	7	327		1,386

" K " FACTOR : 0.09 INTERSECTION ADT (V) = TOTAL DAILY APPROACH VOLUME : 15,400

TOTAL # OF CRASHES : 8 # OF YEARS : 3 AVERAGE # OF CRASHES PER YEAR (A) : 2.67

CRASH RATE CALCULATION :

0.47

$$\text{RATE} = \frac{(A * 1,000,000)}{(V * 365)}$$

Comments : The average crash rate for signalized intersections in District 3 is 0.89 MEV

Project Title & Date : 15104-129 Parker Street, Maynard, MA

APPENDIX
TRIP GENERATION CALCULATIONS

TRIP GENERATION WORKSHEET

LAND USE: *Shopping Center*

LAND USE CODE: 820

Independent Variable---Trips per 1000 SF GLA

PROJECT NAME: Maynard

Current Proposal

PROJECT # :

Gross Leasable Area (KSF): 240.5

WEEKDAY

RATES:

	Total Trip Ends			Directional Dist.		Number of Studies
	Average	Low	High	Enter	Exit	
DAILY	42.70	12.50	270.89	50%	50%	302
AM PEAK HOUR	0.96	0.10	9.05	62%	38%	104
PM PEAK HOUR	3.71	0.68	29.27	48%	52%	426

TRIPS:

	BY AVERAGE			BY REGRESSION			R ²
	Total	Enter	Exit	Total	Enter	Exit	
DAILY	10269	5135	5135	12013	6007	6007	0.79
AM PEAK	231	143	88	266	165	101	0.56
PM PEAK	892	428	464	1079	518	561	0.81

SATURDAY

RATES:

	Total Trip Ends			Directional Dist.		Number of Studies
	Average	Low	High	Enter	Exit	
DAILY	49.97	16.70	227.50	50%	50%	123
GEN PEAK HR	4.82	1.46	18.32	52%	48%	128

TRIPS:

	BY AVERAGE			BY REGRESSION			R ²
	Total	Enter	Exit	Total	Enter	Exit	
DAILY	12017	6009	6009	16060	8030	8030	0.82
PEAK HR	1159	603	556	1546	804	742	0.83

SUNDAY

RATES:

	Total Trip Ends			Directional Dist.		Number of Studies
	Average	Low	High	Enter	Exit	
DAILY	25.24	4.15	148.15	50%	50%	77
PEAK HR	3.12	0.39	12.40	49%	51%	39

TRIPS:

	BY AVERAGE			BY REGRESSION			R ²
	Total	Enter	Exit	Total	Enter	Exit	
DAILY	6070	3035	3035	7973	3987	3987	0.52
PEAK HR	750	368	383	<---- NOT GIVEN ---->			

SOURCE: Trip Generation, 9th Edition, Institute of Transportation Engineers, 2012.

TRIP GENERATION WORKSHEET

LAND USE: *General Office Building*
 LAND USE CODE: 710 Independent Variable---1000 SF GFA
 PROJECT NAME: No-Build West Bridgewater
 PROJECT #: 13016.002 Gross Floor Area (KSF): 30.3

WEEKDAY

RATES:	Total Trip Ends			Directional Dist.		Number of Studies
	Average	Low	High	Enter	Exit	
DAILY	11.03	3.58	28.80	50%	50%	79
AM PEAK HR	1.56	0.60	5.98	88%	12%	218
PM PEAK HR	1.49	0.49	6.39	17%	83%	236

TRIPS:

	BY AVERAGE			BY REGRESSION			R ²
	Total	Enter	Exit	Total	Enter	Exit	
DAILY	334	167	167	530	265	265	0.81
AM PEAK	47	41	6	74	65	9	0.83
PM PEAK	45	8	37	112	19	93	0.82

SATURDAY

RATES:	Total Trip Ends			Directional Dist.		Number of Studies
	Average	Low	High	Enter	Exit	
DAILY	2.46	0.59	14.67	50%	50%	18
GEN PEAK HR	0.43	0.16	1.77	54%	46%	11

TRIPS:

	BY AVERAGE			BY REGRESSION			R ²
	Total	Enter	Exit	Total	Enter	Exit	
DAILY	75	38	38	93	47	47	0.64
PEAK HR	13	7	6	n/a	n/a	n/a	n/a

SUNDAY

RATES:	Total Trip Ends			Directional Dist.		Number of Studies
	Average	Low	High	Enter	Exit	
DAILY	1.05	0.19	7.33	50%	50%	18
GEN PEAK HR	0.16	0.06	1.37	58%	42%	11

	BY AVERAGE			BY REGRESSION			R ²
	Total	Enter	Exit	Total	Enter	Exit	
DAILY	32	16	16	n/a	n/a	n/a	n/a
PEAK HR	5	3	2	n/a	n/a	n/a	n/a

TRIP GENERATION WORKSHEETLAND USE: *Health/Fitness Club*

LAND USE CODE: 492

Independent Variable---Trips per 1000 SF GLA

PROJECT NAME: Walpole Residence

Current Proposal

PROJECT # : 15114

Gross Leasable Area (KSF): 20.0

WEEKDAY

RATES:

	Total Trip Ends			Directional Dist.		Number of Studies
	Average	Low	High	Enter	Exit	
DAILY	32.93			50%	50%	1
AM PEAK HOUR	1.41	0.30	2.00	50%	50%	6
PM PEAK HOUR	3.71	2.35	4.30	57%	43%	6
AM GEN PEAK HOUR	1.43	0.30	2.67	47%	53%	4
PM GEN PEAK HOUR	4.06	3.27	4.30	51%	49%	3

TRIPS:

	BY AVERAGE		
	Total	Enter	Exit
DAILY	659	330	330
AM PEAK	28	14	14
PM PEAK	74	42	32
AM GEN PEAK HOUR	29	14	15
PM GEN PEAK HOUR	81	41	40

BY REGRESSION			
Total	Enter	Exit	R ²
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-

SATURDAY

RATES:

	Total Trip Ends			Directional Dist.		Number of Studies
	Average	Low	High	Enter	Exit	
DAILY	20.87			50%	50%	1
GEN PEAK HR	2.78	2.60	2.87	45%	55%	2

TRIPS:

	BY AVERAGE		
	Total	Enter	Exit
DAILY	417	209	209
PEAK HR	56	25	31

BY REGRESSION			
Total	Enter	Exit	R ²
-	-	-	-
-	-	-	-

SUNDAY

RATES:

	Total Trip Ends			Directional Dist.		Number of Studies
	Average	Low	High	Enter	Exit	
DAILY	26.73			50%	50%	1
PEAK HR	2.47			50%	50%	1

TRIPS:

	BY AVERAGE		
	Total	Enter	Exit
DAILY	535	268	268
PEAK HR	49	25	25

BY REGRESSION			
Total	Enter	Exit	R ²
-	-	-	-
-	-	-	-

TRIP GENERATION WORKSHEET

LAND USE: *Senior Adult Housing - Attached*
 LAND USE CODE: 252 Independent Variable---Dwelling Units
 PROJECT NAME: Maynard
 PROJECT #: xx Number of Units: 143

WEEKDAY

RATES:	Total Trip Ends			Directional Dist.		Number of Studies
	Average	Low	High	Enter	Exit	
DAILY	3.44	2.59	4.79	50%	50%	5
AM PEAK	0.20	0.06	0.27	34%	66%	10
PM PEAK	0.25	0.08	0.43	54%	46%	10
PK GEN AM	0.39	0.19	0.64	46%	54%	8
PK GEN PM	0.35	0.24	0.53	55%	45%	7

	BY AVERAGE		
	Total	Enter	Exit
DAILY	492	246	246
AM PEAK	29	10	19
PM PEAK	36	19	17
PK GEN AM	56	26	30
PK GEN PM	50	28	23

BY REGRESSION			
Total	Enter	Exit	R ²
447	224	224	0.81
28	10	18	0.98
36	19	17	0.96
48	22	26	0.70
45	25	20	0.82

SATURDAY

RATES:	Total Trip Ends			Directional Dist.		Number of Studies
	Average	Low	High	Enter	Exit	
DAILY	2.61	1.84	4.07	50%	50%	5
PEAK HR	0.31	0.23	0.43	57%	43%	6

	BY AVERAGE		
	Total	Enter	Exit
DAILY	373	187	187
PEAK HR	44	25	19

BY REGRESSION			
Total	Enter	Exit	R ²
325	163	163	0.67
45	26	19	0.97

SUNDAY

RATES:	Total Trip Ends			Directional Dist.		Number of Studies
	Average	Low	High	Enter	Exit	
DAILY	2.84	2.20	4.25	50%	50%	5
PEAK HR	0.41	0.27	0.55	NOT GIVEN	NOT GIVEN	5

	BY AVERAGE		
	Total	Enter	Exit
DAILY	406	203	203
PEAK HR	59	#VALUE!	#VALUE!

BY REGRESSION			
Total	Enter	Exit	R ²
353	177	177	0.75
66	#VALUE!	#VALUE!	0.63

TRIP GENERATION WORKSHEET

LAND USE: *Apartment*
LAND USE CODE: 220 Independent Variable---Dwelling Units

PROJECT NAME:
PROJECT #: Number of Units: 180

WEEKDAY

RATES:

	Total Trip Ends			Directional Dist.		Number
	Average	Low	High	Enter	Exit	of Studies
DAILY	6.65	1.27	12.50	50%	50%	88
AM PEAK	0.51	0.10	1.02	20%	80%	78
PM PEAK	0.62	0.10	1.64	65%	35%	90
PK GEN AM	0.55	0.10	1.08	29%	71%	83
PK GEN PM	0.67	0.10	1.64	61%	39%	85

	BY AVERAGE			BY REGRESSION			R ²
	Total	Enter	Exit	Total	Enter	Exit	
DAILY	1197	599	599	1214	607	607	0.87
AM PEAK	92	18	74	92	18	74	0.83
PM PEAK	112	73	39	117	76	41	0.77
PK GEN AM	99	29	70	100	29	71	0.82
PK GEN PM	121	74	47	123	75	48	0.80

SATURDAY

RATES:

	Total Trip Ends			Directional Dist.		Number
	Average	Low	High	Enter	Exit	of Studies
DAILY	6.39	2.84	8.40	50%	50%	16
PEAK HR	0.52	0.26	1.05	-	-	14

	BY AVERAGE			BY REGRESSION			R ²
	Total	Enter	Exit	Total	Enter	Exit	
DAILY	1150	575	575	1157	579	579	0.85
PEAK HR	94	-	-	93	-	-	0.56

SUNDAY

RATES:

	Total Trip Ends			Directional Dist.		Number
	Average	Low	High	Enter	Exit	of Studies
DAILY	5.86	3.21	7.53	50%	50%	14
PEAK HR	0.51	0.26	1.43	-	-	13

	BY AVERAGE			BY REGRESSION			R ²
	Total	Enter	Exit	Total	Enter	Exit	
DAILY	1055	528	528	1054	527	527	0.82
PEAK HR	92	-	-	*** Not Given ***			

Weekday (use)

Scenario: 129 Parker Street, Maynard
Time Period: Weekday Daily
Analyst: JG
Date: 1/29/2016

Internal Trip Capture Calculations

LAND USE A - RETAIL				
ITE LUC:		820; 492		
Size:		260.49		
	Total	Internal	External	
Enter	6351	312	6039	
Exit	6351	301	6050	
Total	12673	613	12089	
%	100%	5%	95%	



GREEN INTERNATIONAL AFFILIATES, INC.
Civil and Structural Engineers
239 Littleton road, Suite 3
WESTFORD, MA 01886

A to B				B to A			
	% Demand	Trips			% Demand	Trips	
Retail	11%	699		Retail	9%	572	
			Balanced				Balanced
			262				301
	% Demand	Trips			% Demand	Trips	
Retail	33%	262		Retail	38%	301	

A to C				C to A			
	% Demand	Trips			% Demand	Trips	
Retail	3%	191		Retail	22%	1397	
			Balanced				Balanced
			40				11
	% Demand	Trips			% Demand	Trips	
Retail	15%	40		Retail	4%	11	

LAND USE B - RESIDENTIAL				
ITE LUC:		220;252		
Size:		318 units		
	Total	Internal	External	
Enter	793	267	526	
Exit	793	301	492	
Total	1586	568	1018	
%	100%	36%	64%	

LAND USE C - Office				
ITE LUC:		710		
Size:		30.3 kSF		
	Total			
Enter	265			
Exit	265			
Total	530			
%				

B to C				C to B			
	% Demand	Trips			% Demand	Trips	
Retail	0%	0		Retail	2%	5	
			Balanced				Balanced
			0				5
	% Demand	Trips			% Demand	Trips	
Retail	0%	0		Retail	3%	24	

	Enter	Exit	Total
Retail	312	301	613
Residential	267	301	568
Office	40	16	56

Net External Trips for Multi-Use Development				
	Land Use A	Land Use B	Land Use C	Total
Enter	6039	526	0	6565
Exit	6050	492	0	6541
Total	12089	1018	0	13106
Single-Use Trip Gen Est.	12673	1586	530	14789
Internal Capture Rate	11.38%			

NCHRP 8-51 Internal Trip Capture Estimation Tool					
Project Name:	129 Parker Street	Organization:	Green International Affiliates		
Project Location:	Maynard	Performed By:	JG		
Scenario Description:	AM Peak Hour	Date:	1/29/2016		
Analysis Year:	2022	Checked By:			
Analysis Period:	AM Street Peak Hour	Date:			

Table 1-A: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)						
Land Use	Development Data (For Information Only)			Estimated Vehicle-Trips		
	ITE LUCs ¹	Quantity	Units	Total	Entering	Exiting
Office	710	30		74	65	9
Retail	820; 492	261	ksf	295	180	115
Restaurant				0		
Cinema/Entertainment				0		
Residential	220; 252	322	units	120	28	92
Hotel				0		
All Other Land Uses ²				0		
Total				489	273	216

Table 2-A: Mode Split and Vehicle Occupancy Estimates						
Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.	% Transit	% Non-Motorized	Veh. Occ.	% Transit	% Non-Motorized
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						
All Other Land Uses ²						

Table 3-A: Average Land Use Interchange Distances (Feet Walking Distance)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-A: Internal Person-Trip Origin-Destination Matrix*						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		3	0	0	0	0
Retail	3		0	0	1	0
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	2	1	0	0		0
Hotel	0	0	0	0	0	

Table 5-A: Computations Summary			
	Total	Entering	Exiting
All Person-Trips	489	273	216
Internal Capture Percentage	4%	4%	5%
External Vehicle-Trips ³	469	263	206
External Transit-Trips ⁴	0	0	0
External Non-Motorized Trips ⁴	0	0	0

Table 6-A: Internal Trip Capture Percentages by Land Use		
Land Use	Entering Trips	Exiting Trips
Office	8%	33%
Retail	2%	3%
Restaurant	N/A	N/A
Cinema/Entertainment	N/A	N/A
Residential	4%	3%
Hotel	N/A	N/A

¹ Land Use Codes (LUCs) from <i>Trip Generation Informational Report</i> , published by the Institute of Transportation Engineers.
² Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator
³ Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A
⁴ Person-Trips
*Indicates computation that has been rounded to the nearest whole number.
<i>Estimation Tool Developed by the Texas Transportation Institute</i>

Project Name:	129 Parker Street
Analysis Period:	AM Street Peak Hour

Table 7-A: Conversion of Vehicle-Trip Ends to Person-Trip Ends						
Land Use	Table 7-A (D): Entering Trips			Table 7-A (O): Exiting Trips		
	Veh. Occ.	Vehicle-Trips	Person-Trips*	Veh. Occ.	Vehicle-Trips	Person-Trips*
Office	1.00	65	65	1.00	9	9
Retail	1.00	180	180	1.00	115	115
Restaurant	1.00	0	0	1.00	0	0
Cinema/Entertainment	1.00	0	0	1.00	0	0
Residential	1.00	28	28	1.00	92	92
Hotel	1.00	0	0	1.00	0	0

Table 8-A (O): Internal Person-Trip Origin-Destination Matrix (Computed at Origin)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		3	6	0	0	0
Retail	33		15	0	16	0
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	2	1	18	0		0
Hotel	0	0	0	0	0	

Table 8-A (D): Internal Person-Trip Origin-Destination Matrix (Computed at Destination)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		58	0	0	0	0
Retail	3		0	0	1	0
Restaurant	9	14		0	1	0
Cinema/Entertainment	0	0	0		0	0
Residential	2	31	0	0		0
Hotel	2	7	0	0	0	

Table 9-A (D): Internal and External Trips Summary (Entering Trips)						
Destination Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles ¹	Transit ²	Non-Motorized ²
Office	5	60	65	60	0	0
Retail	4	176	180	176	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	1	27	28	27	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses ³	0	0	0	0	0	0

Table 9-A (O): Internal and External Trips Summary (Exiting Trips)						
Origin Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles ¹	Transit ²	Non-Motorized ²
Office	3	6	9	6	0	0
Retail	4	111	115	111	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	3	89	92	89	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses ³	0	0	0	0	0	0

¹Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A

²Person-Trips

³Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator

*Indicates computation that has been rounded to the nearest whole number.

NCHRP 8-51 Internal Trip Capture Estimation Tool					
Project Name:	129 Parker Street	Organization:	Green International Affiliates		
Project Location:	Maynard	Performed By:	JG		
Scenario Description:	PM Peak Hour	Date:	1/29/2016		
Analysis Year:	2022	Checked By:			
Analysis Period:	PM Street Peak Hour	Date:			

Table 1-P: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)						
Land Use	Development Data (For Information Only)			Estimated Vehicle-Trips		
	ITE LUCs ¹	Quantity	Units	Total	Entering	Exiting
Office	710	30		112	19	93
Retail	820; 492	261	ksf	1,155	561	594
Restaurant				0		
Cinema/Entertainment				0		
Residential	220; 252	322	units	153	95	58
Hotel				0		
All Other Land Uses ²						
Total				1420	675	745

Table 2-P: Mode Split and Vehicle Occupancy Estimates						
Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.	% Transit	% Non-Motorized	Veh. Occ.	% Transit	% Non-Motorized
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						
All Other Land Uses ²						

Table 3-P: Average Land Use Interchange Distances (Feet Walking Distance)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		1000			1100	
Retail					1300	
Restaurant						
Cinema/Entertainment						
Residential		1300				
Hotel						

Table 4-P: Internal Person-Trip Origin-Destination Matrix*						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		14	0	0	2	0
Retail	6		0	0	44	0
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	2	16	0	0		0
Hotel	0	0	0	0	0	

Table 5-P: Computations Summary			
	Total	Entering	Exiting
All Person-Trips	1,420	675	745
Internal Capture Percentage	12%	12%	11%
External Vehicle-Trips ³	1,252	591	661
External Transit-Trips ⁴	0	0	0
External Non-Motorized Trips ⁴	0	0	0

Table 6-P: Internal Trip Capture Percentages by Land Use		
Land Use	Entering Trips	Exiting Trips
Office	42%	17%
Retail	5%	8%
Restaurant	N/A	N/A
Cinema/Entertainment	N/A	N/A
Residential	48%	31%
Hotel	N/A	N/A

¹Land Use Codes (LUCs) from *Trip Generation Informational Report*, published by the Institute of Transportation Engineers.

²Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator

³Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P

⁴Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas Transportation Institute

Project Name:	129 Parker Street
Analysis Period:	PM Street Peak Hour

Table 7-P: Conversion of Vehicle-Trip Ends to Person-Trip Ends						
Land Use	Table 7-P (D): Entering Trips			Table 7-P (O): Exiting Trips		
	Veh. Occ.	Vehicle-Trips	Person-Trips*	Veh. Occ.	Vehicle-Trips	Person-Trips*
Office	1.00	19	19	1.00	93	93
Retail	1.00	561	561	1.00	594	594
Restaurant	1.00	0	0	1.00	0	0
Cinema/Entertainment	1.00	0	0	1.00	0	0
Residential	1.00	95	95	1.00	58	58
Hotel	1.00	0	0	1.00	0	0

Table 8-P (O): Internal Person-Trip Origin-Destination Matrix (Computed at Origin)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		14	4	0	2	0
Retail	12		172	24	130	30
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	2	16	12	0		2
Hotel	0	0	0	0	0	

Table 8-P (D): Internal Person-Trip Origin-Destination Matrix (Computed at Destination)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		34	0	0	4	0
Retail	6		0	0	44	0
Restaurant	6	281		0	15	0
Cinema/Entertainment	1	22	0		4	0
Residential	11	38	0	0		0
Hotel	0	11	0	0	0	

Table 9-P (D): Internal and External Trips Summary (Entering Trips)						
Destination Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles ¹	Transit ²	Non-Motorized ²
Office	8	11	19	11	0	0
Retail	30	531	561	531	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	46	49	95	49	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses ³	0	0	0	0	0	0

Table 9-P (O): Internal and External Trips Summary (Exiting Trips)						
Origin Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles ¹	Transit ²	Non-Motorized ²
Office	16	77	93	77	0	0
Retail	50	544	594	544	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	18	40	58	40	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses ³	0	0	0	0	0	0

¹Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P

²Person-Trips

³Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator

*Indicates computation that has been rounded to the nearest whole number.

Saturday (based on Weekday)

Scenario: 129 Parker Street, Maynard
Time Period: Saturday Daily Total
Analyst: JG
Date: 1/29/2016

Internal Trip Capture Calculations

LAND USE A - RETAIL

ITE LUC: 820; 492			
Size: 261.1 kSF			
	Total	Internal	External
Enter	8258	286	7972
Exit	8258	253	8005
Total	16516	539	15977
%	100%	3%	97%



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A to B		B to A	
Retail	% Demand Trips 11% 908	Retail	% Demand Trips 9% 743
Balanced		Balanced	
247		285	
Retail	% Demand Trips 33% 247	Retail	% Demand Trips 38% 285

A to C		C to A	
Retail	% Demand Trips 3% 248	Retail	% Demand Trips 22% 1817
Balanced		Balanced	
6		2	
Retail	% Demand Trips 15% 6	Retail	% Demand Trips 4% 2

LAND USE B - RESIDENTIAL

ITE LUC: 220;252			
Size: 318 units			
	Total	Internal	External
Enter	749	248	501
Exit	749	285	464
Total	1498	533	965
%	100%	36%	64%

LAND USE C - Office

ITE LUC: 710			
Size: 30.3 kSF			
	Total	Internal	External
Enter	38		38
Exit	38	2	36
Total	76	2	74

B to C		C to B	
Retail	% Demand Trips 0% 0	Retail	% Demand Trips 2% 1
Balanced		Balanced	
0		1	
Retail	% Demand Trips 0% 0	Retail	% Demand Trips 3% 22

	Enter	Exit	Total
Retail*	286	253	539
Residential	248	285	533
Office	6	2	8

Net External Trips for Multi-Use Development				
	Land Use A	Land Use B	Land Use C	Total
Enter	7972	501	38	8511
Exit	8005	464	36	8505
Total	15977	965	74	17016
Single-Use Trip Gen Est.	16516	1498	76	18090
Internal Capture Rate	5.94%			

* The number of daily internal capture trips for cinema and retail calculated here via the method described in the ITE Handbook results in only a few more trips than the number of internal capture trips per Saturday peak hour as calculated via methodology adapting NCHRP Report 684. Hence, a factor based on the number of weekday daily internal trips to peak (PM) hourly internal trips was used to calculate the total number of internal trips for cinema and retail combined for Saturday, which results in a greater figure than that calculated on this sheet.

NCHRP 8-51 Internal Trip Capture Estimation Tool					
Project Name:	129 Parker Street	Organization:	Green International Affiliates		
Project Location:	Maynard	Performed By:	JG		
Scenario Description:	Saturday Peak Hour	Date:	1/29/2016		
Analysis Year:	2022	Checked By:			
Analysis Period:	Saturday (based on wkday PM) Peak Hour	Date:			

Table 1-P: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)						
Land Use	Development Data (For Information Only)			Estimated Vehicle-Trips		
	ITE LUCs ¹	Quantity	Units	Total	Entering	Exiting
Office	710	30		13	7	6
Retail	820; 492	261	ksf	1606	831	775
Restaurant				0		
Cinema/Entertainment				0		
Residential	252;220	318	houses; units	136	71	65
Hotel				0		
All Other Land Uses ²				0		
Total				1755	909	846

Table 2-P: Mode Split and Vehicle Occupancy Estimates						
Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.	% Transit	% Non-Motorized	Veh. Occ.	% Transit	% Non-Motorized
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						
All Other Land Uses ²						

Table 3-P: Average Land Use Interchange Distances (Feet Walking Distance)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		1000			1100	
Retail					1300	
Restaurant						
Cinema/Entertainment						
Residential		1300				
Hotel						

Table 4-P: Internal Person-Trip Origin-Destination Matrix*						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		1	0	0	0	0
Retail	2		0	0	33	0
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	3	18	0	0		0
Hotel	0	0	0	0	0	

Table 5-P: Computations Summary			
	Total	Entering	Exiting
All Person-Trips	1,755	909	846
Internal Capture Percentage	6%	6%	7%
External Vehicle-Trips ³	1,641	852	789
External Transit-Trips ⁴	0	0	0
External Non-Motorized Trips ⁴	0	0	0

Table 6-P: Internal Trip Capture Percentages by Land Use		
Land Use	Entering Trips	Exiting Trips
Office	71%	17%
Retail	2%	5%
Restaurant	N/A	N/A
Cinema/Entertainment	N/A	N/A
Residential	46%	32%
Hotel	N/A	N/A

¹Land Use Codes (LUCs) from *Trip Generation Informational Report*, published by the Institute of Transportation Engineers.

²Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator

³Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P

⁴Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas Transportation Institute

Project Name:	129 Parker Street
Analysis Period:	Saturday (based on wkday PM) Peak Hour

Table 7-P: Conversion of Vehicle-Trip Ends to Person-Trip Ends						
Land Use	Table 7-P (D): Entering Trips			Table 7-P (O): Exiting Trips		
	Veh. Occ.	Vehicle-Trips	Person-Trips*	Veh. Occ.	Vehicle-Trips	Person-Trips*
Office	1.00	7	7	1.00	6	6
Retail	1.00	831	831	1.00	775	775
Restaurant	1.00	0	0	1.00	0	0
Cinema/Entertainment	1.00	0	0	1.00	0	0
Residential	1.00	71	71	1.00	65	65
Hotel	1.00	0	0	1.00	0	0

Table 8-P (O): Internal Person-Trip Origin-Destination Matrix (Computed at Origin)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		1	0	0	0	0
Retail	16		225	31	169	39
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	3	18	14	0		2
Hotel	0	0	0	0	0	

Table 8-P (D): Internal Person-Trip Origin-Destination Matrix (Computed at Destination)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		51	0	0	3	0
Retail	2		0	0	33	0
Restaurant	2	416		0	11	0
Cinema/Entertainment	0	33	0		3	0
Residential	4	56	0	0		0
Hotel	0	17	0	0	0	

Table 9-P (D): Internal and External Trips Summary (Entering Trips)						
Destination Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles ¹	Transit ²	Non-Motorized ²
Office	5	2	7	2	0	0
Retail	19	812	831	812	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	33	38	71	38	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses ³	0	0	0	0	0	0

Table 9-P (O): Internal and External Trips Summary (Exiting Trips)						
Origin Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles ¹	Transit ²	Non-Motorized ²
Office	1	5	6	5	0	0
Retail	35	740	775	740	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	21	44	65	44	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses ³	0	0	0	0	0	0

¹Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P

²Person-Trips

³Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator

*Indicates computation that has been rounded to the nearest whole number.

129 Parker Street
Maynard, MA

	ITE Pass-by / Diverted trips *	Parker St Vol. (based on 2015 ATR)	Route 117 Vol. (estimate based on the 2012 TMC's and 2015 K-factor)	Total Combined Volume On Route 117 and Parker Street	ITE Pass-by/Diverted Trips, % of Adjacent Street Traffic	Pass-by / Diverted Trip Limits (15% of adjacent street traffic)	Delta	Effective Pass-by Rate
Weekday								
AM	98	873	1085	1958	5.01%	n/a	n/a	34.0%
PM	366	971	1166	2137	17.13%	321	-45	29.9%
Daily	4100	10968	13440	24408	16.80%	3661	-439	30.3%
Saturday								
Midday Peak	404	730	513	1243	32.5%	186	-218	12.0%
Daily	4154	8169	5830	13999	29.7%	2100	-2054	13.2%

* Pass-by rate of 34% during Weekday, and 26% during Saturday based on ITE Trip Generation Handbook



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